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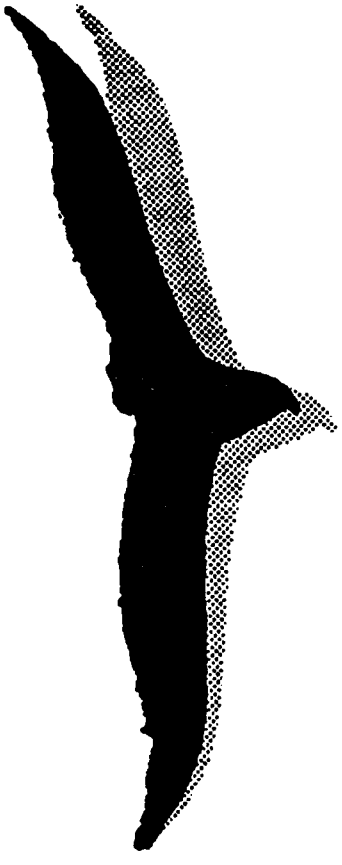

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1. Introduction

Much recent work on saving and consumption behavior has emphasized the importance of examining household data to study the predictions of the life cycle-permanent income model (LCH-PIH model). Simple versions of the LCH-PIH model predict, among other things, that (1) there exists full displacement between discretionary saving and mandatory (contractual) saving and (2) that the elderly exhaust their wealth holdings. In this study we try to answer the question whether or not the two predictions above characterize (in part) the saving behavior of Dutch households.

In order to estimate the level of displacement between several forms of saving, it is useful to make a distinction between: 1) mandatory saving, 2) notional saving and 3) discretionary saving. Discretionary saving is defined as the changes in financial and real wealth of which magnitude and composition are under the control of the household. Mandatory saving is defined as changes in wealth through mandatory contributions to funded pension plans. Notional savings are contributions to pay-as-you-go systems such as public pensions and social insurance schemes. The displacement of discretionary saving by mandatory saving is of considerable policy interest. If there is full displacement, mandatory schemes are essentially superfluous and it can be left to private households to accumulate wealth to live off in old age. On the other hand, if there is (considerably) less than full displacement, mandatory schemes may be necessary to make sure that households save enough to be comfortable in old age.[1]

As we said before, according to the simple version of the LCH-model retired households dissave. This prediction cannot be tested by using cross-section data because cohort and age effects cannot be disentangled. However, we have longitudinal data at our disposal which permits us to construct cohort corrected age-saving profiles. This allows us to investigate whether or not people dis-save during retirement.

This study is organized as follows: after a description of the data used (cf. Section 2) the chapter describes, in Section 3, the distribution of income, notional and mandatory saving in the Netherlands. In Section 4 we present the distribution of discretionary saving and wealth across age and cohort. In

[1] This argument leaves out the insurance aspect of mandatory schemes. To leave old age provisions entirely to individual household decisions, there also have to exist well functioning annuity markets, so that households can convert accumulated wealth into annuities upon retirement, for instance.

the second part of the chapter (Section 5), we provide a short description of the Dutch pension and tax system. Moreover, we try to answer the question whether the existence of an extensive pension and social insurance system displaces discretionary saving. The aggregate data provide some suggestive evidence in favor of this hypothesis: the so-called 'free saving rate' (which excludes 'contractual saving' through pension funds and life insurance companies) is very low in The Netherlands. Alessie, Hochgürtel, Van Soest (2000) report that in the period 1985-1997 (with the exception of 1989 and 1990) the total household saving rate was fairly constant and equal to about 12%. In the 1990's the contractual saving rate gradually increased from 10% to 12%. As a result, the free saving rate was low, with a decreasing trend towards zero. Although this decreasing trend in the free saving rate concomitant with an increase in contractual saving is suggestive of displacement, the low free saving rate can also be attributed to other factors such as the substantial capital gains households received in the nineties due to the developments in the housing and stock markets. Therefore, we review in Section 5 somewhat more convincing evidence on the displacement issue based on longitudinal data. Inevitably, even this evidence is not that strong because during the eighties and nineties the Dutch pension system has not been restructured in a dramatic way and because the data sets do not contain that much information on the details of the respondents' occupational pension schemes. Therefore, comparing saving patterns across countries using micro data might help to identify more precisely the impact of notional and mandatory saving on discretionary saving.

2. Data

We mainly use data from the Socio-Economic Panel (SEP). The SEP is a longitudinal survey administered by Statistics Netherlands (CBS) consisting of approximately 5,000 households. The purpose of the SEP, as summarized in CBS publications (see, for example, CBS (1991)), is to provide a description of the most important elements of individual and household welfare and to monitor changes in these elements. The SEP has been launched in April 1984. The same households were interviewed in October 1984 and then twice a year (in April and October) until 1989. Since 1990 the survey has been conducted once a year in May. The survey is representative of the Dutch population, excluding those living in special institutions like nursing homes. In order to arrive at a

representative sample, Statistics Netherlands has applied a two-stage sampling procedure to collect the initial April 1984 sample. In the first stage, municipalities are drawn with probabilities depending on the number of inhabitants (big cities are drawn with certainty). In the second stage, addresses are selected randomly. All households present at the selected address are interviewed, up to a maximum of three households. The initial rate of unit-non response was equal to 50%. In order to address the problem of sample attrition, from 1986 onwards Statistics Netherlands regularly adds new households to the SEP. The yearly attrition rate is equal to about 10%. In order to keep the sample as representative as possible, Statistics Netherlands refreshes the sample by replacing those households who have left the sample by 'similar' households. In case of refreshment samples the rate of unit-non-response is equal to about 65%.

In contrast with the American Survey of Consumer Finances (SCF) the wealthy households are not oversampled (see e.g. Avery, Elliehausen and Kennickell (1988) for more information about the SCF). The SEP also does not have a low income supplement as is the case with the Panel Study of Income Dynamics (PSID).

In the October interviews, information has been collected at the respondent level[2] on socio-economic characteristics, income and labor market participation. The April interviews also contain information about socio-economic characteristics, but rather than gathering data about income, since 1987 the April questionnaires have included questions on a wide range of assets and liabilities. More details about the income and wealth data of the SEP can be found in Appendix 1. In this chapter, we present summary statistics on net worth, financial wealth, and real wealth. Net worth is obtained by subtracting total liabilities from total assets. We also analyze financial wealth holdings. Financial wealth has been defined as the difference between net worth on the one hand and housing equity (value of the primary residence plus life insurance mortgage minus remaining mortgage debt), other real estate and the value of the cars on the other hand. Real wealth is defined to be the difference between net worth and financial wealth.

The SEP does not contain direct information on the following asset components: 1) cash

[2] A respondent is a member of the household who is at least 16 years old.

holdings; 2) the cash value of whole life insurances (except the life insurance mortgage[3]) and of privately purchased annuity insurances; 3) social security wealth; 4) occupational pension wealth (see Appendix 1 for more details).

For this study we have made the following sample selections: 1) composite households and households of which the head is younger than 20 years[4], are excluded from the analysis; 2) the self-employed are removed altogether from the sample because no wealth data have been collected for this group.

Sleijpe and Dirven (1999) have compared the income data of the SEP with those of the Income Panel Survey (IPS). This is a large survey (75,000 households), based on administrative records from the income and wealth tax register, supplemented with some information from the SEP. Sleijpe and Dirven (1999) have found that the distribution of disposable household income does not differ much across the two samples.

The income data are measured more precisely than the stock data (wealth). Alessie and Kapteyn (1999) have compared the wealth data of the SEP with those of the IPS. If one takes the IPS figures as the reference point, the SEP underestimates average net worth by 20%. A part of this underestimation has been caused by the fact that the SEP does not observe the wealth holding of the self-employed. However, the study of Alessie and Kapteyn (1999) also suggests that stock and bond holdings are severely under reported in the SEP.[5] One should keep in mind that the IPS figure on stock and bond holdings includes stocks from a substantial holding.[6] Typically, these stocks are not listed on the Dutch

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[3] See Appendix 1 for more details about life insurance mortgages.

[4] In the SEP the head of the household is in principle defined to be the husband in case of married couples.

[5] Just recently, Statistics Netherlands published the National Accounts for the year 1998. For the first time, the National Accounts include the Flows of Funds Statement for the sector 'households'. Comparison of the NA data with the IPS suggests that even in the IPS the average value of stock holdings might be underestimated (see Alessie, Hochgürtel and van Soest (2000) for more details about this comparison).

[6] In the note 'Taxation in the Netherlands' of the ministry of Finance (see http://www.minfin.nl) the term income from a substantial holding in a corporation is described as follows: a taxpayer is regarded as having a substantial holding in a corporation if he or she, either alone or with his or her spouse, holds directly or indirectly 5% of the issued capital. If the corporation has issued different classes of shares, a substantial holding also exists if the taxpayer, either alone or with his or her spouse, holds more than 5% of the issued capital of a particular class of shares. If the taxpayer holds a substantial interest in a corporation, jouissance rights and debt-claims issued by that corporation and held directly or indirectly by the taxpayer, either alone or with his or her spouse, are regarded as forming part of the substantial holding.

exchange. Given the way the SEP question on stock holdings has been phrased, we suspect that especially the stocks from a substantial holding are severely under-reported by the SEP respondents. A comparison with another Dutch dataset, the CentER Savings Survey (CSS), also suggests that the ownership rate of stocks and mutual funds is substantially under-estimated in the SEP.[7] Finally, the underestimation of average net worth is also partly due to the fact that in the SEP checking and saving accounts balances are under reported.

The SEP does not contain information on consumption expenditures. As a result of this, the SEP can only measure saving by taking the first difference of net worth. This saving measure therefore includes (unrealized) capital gains. We will also use data from the Dutch Consumer Expenditure Survey (CES) in order to obtain a 'residual' saving measure, defined as the difference between income and consumption. Appendix 1 provides some information about the CES.

3. The distribution of income and wealth

Although the pension and tax system will be described more fully in Section 5, it is useful to note that old age provisions in The Netherlands essentially consist of three tiers. The first tier is Social Security (SS); the second tier consists of mandatory occupational pensions; the third tier consists of private savings.

In this section we pay attention to the distribution of gross income and private wealth of households and to the definition and distribution of mandatory and notional saving. The private wealth measure does not include Social Security Wealth (SSW) and Occupational Pension Wealth (PW). In order to investigate the displacement between private (discretionary) wealth and SSW and PW, it would have been nice to have measures for PW and SSW. However, given the scarce information in the SEP on pensions and the heterogeneity of the occupational pension schemes, it is difficult to construct a variable which could serve as a proxy for PW (see Alessie, Kapteyn and Klijn (1997) and Euwals (1999) for an effort to compute PW). Therefore, in this chapter we abstain from such an exercise.

In this section, we mainly perform a cross-sectional analysis for which we have used the 1996 wave of the SEP. However, it is well known that in a cross-section one cannot disentangle cohort from age

[7] According to the SEP the 1996 ownership rate of stocks and mutual funds is equal to 13.2% and according to the CSS 23.7% (see Alessie, Hochgürtel and van Soest (2000)).

effects. Therefore, we also perform a cohort analysis, similar to e.g. Attanasio (1998), on disposable income and (financial) wealth.

3.1 Gross household income

In Table 3.1 we present the distribution of gross household income by age for the year 1995.[8] The variable 'gross income' includes the following components: wages, asset income, benefits of PAYG and funded pensions, public non-transfer income and net private transfers. More details about the construction of the variable 'gross household income' and its components can be found in Appendix 1. Capital gains are not included in asset income. From table 3.1 the following conclusions can be drawn:

- Average gross income is equal to 40,240 [9]. Not surprisingly, median income is somewhat lower (35,980) , indicating that the distribution of gross income is rightly skewed.
- Average and median income rise sharply with age until about age 35. Between age 35 and age 54 average income is fairly constant; it drops considerably between age 55 and 64 and even more after the mandatory retirement age of 65. We will explain these phenomena below when we look at the breakdown of gross income . In any case, it should be realized that cohort and age effects are not disentangled in table 3.1 (nor in any other table presented in this section). After age 75 average and median gross income decrease even further, because household size becomes smaller after that age and consequently one receives less pension.

A breakdown of gross income into a number of components is presented in table 3.2. The component shares sum to 100% by row. From table 3.2 it can be seen that until 55 wages are the most important component of gross income: between age 25 and 50 the average wage share varies between about 80 and 95 percent. Due to the generous (pay-as-you-go) early retirement schemes (introduced at the beginning of the 1980's) and disability schemes, it is rather attractive to stop working after about age 60 (see e.g., Kapteyn and de Vos (1998)). Therefore, average gross income and the average wage share drop

[8] The 1996 wave of the SEP has been used to construct this table.

[9] All amounts reported in the chapter (including the tables and graphs) are expressed in 1998 EUROS (). We have converted the '1998' Dutch guilder to 1998 Euro via the 1998 dollar ppp.

dramatically after age 55 and especially after age 60. The wage share is virtually equal to zero after the mandatory retirement age of 65. On average, asset income does not seem to be an important income component for most age groups.

After age 65, gross income basically consists only of pensions (including social security). Asset income is on average a rather small income component for the retired (about 5% of gross income). From table 3.2 it becomes clear that for the retired SS is on average a more important income component than the annuitized funded pensions. Its share in gross income is on average equal to 47% for those retired who are younger than 75 and even 59% for those between 75 and 79.

3.2 Mandatory saving

In The Netherlands mandatory saving consists of employers' and employees' contribution to (mandatory) occupational funded pension plans.[10] It should be stressed that in this chapter annuitized pension income is treated as income and not as dissaving. In this respect we adopt the definitions put forward by Brugiavini and Weber (2001) and, consequently, we do not follow the convention of the National Accounts.

Pension premiums are not directly observed in the SEP. Therefore we have imputed these premiums. There is considerable variety in occupational pension schemes. Hence, the imputation of pension premiums is a rather tricky exercise. The SEP contains enough information to identify (former) civil servants. For civil servants and former civil servants who currently receive a UI-benefit or an early retirement benefit, it is possible to impute the pension premiums rather precisely.

The imputation exercise is much more difficult for the majority of employees who are not civil servants or former civil servants (about 70%), i.e. those working in the private sector (and former private sector employees who currently receive an early retirement benefit). Basically, we have adopted a crude imputation formula used by the Netherlands Bureau for Economic Policy Analysis (CPB) in its microtax simulation model (see www.cpb.nl). The CPB has estimated two premium percentages (12.47% for the employer part and 4.59% for the employee part) from data of the National Accounts. CPB assumes that pension premiums are only levied on wage income above a threshold of 12,722 (= gross minimum wage in 1995). Most pension funds apply such a threshold in determining the premiums. Although the

[10] Most pension funds do not allow their clients to make a lump sum withdrawal.

CPB-assumptions are reasonable, their procedure does not take into account the variation in premium percentages and thresholds in the private sector. Therefore, our figures for mandatory pension premiums should be interpreted with care.

Table 3.3 summarizes the distribution of mandatory saving by age. Average (median) mandatory saving is equal to 2,066 (1,292). Average mandatory saving appears to be highest in the age range 35-55 (around 3,400). Obviously, for the retired (>65) households mandatory saving is virtually equal to zero. Since most households in the age range 20-24 do not earn very much, they do not need to pay pension premiums because of the existence of the threshold.

3.3 Notional saving (contributions to pay-as-you-go systems)

Notional saving is equal to the contribution to all pay-as-you-go systems, or the sum of:

- Employees' mandatory contributions to unfunded pension plans:
  - a SS [AOW], tax in 1995: 14.55% of taxable personal income up to a maximum of 20,125 (see Appendix 1 for an explanation of 'taxable personal income');
  - b General widows' and orphans' pensions [AWW], tax in 1995: 1.80% of taxable personal income up to a maximum of 20,125.
- Employees' mandatory contributions to other unfunded schemes (e.g., health and LTC insurance):
  - a. General disability pension [AAW], tax in 1995: 6.30% of taxable personal income up to a maximum of 20,125;
  - b. Special health cost act [AWBZ], tax in 1995: 8.55% of taxable personal income up to a maximum of 20,125 (plus a small nominal premium);
  - c. Sick fund insurance (employee part)[11];
  - d. Payroll tax (employee part), consisting of
    - Short term unemployment benefits [WW];
    - UI-benefits for the civil servants;
    - Disability benefits [WAO];
    - Invalidity pension for ex-civil servants;

[11] Employees with an income below a certain threshold, have a mandatory health insurance, the so-called sick fund.

– Sickness benefits [ZW].

- Employers' mandatory contributions to other unfunded schemes:
  a Sick fund insurance (employers' part);
  b Social insurance premiums (employers' part);
- Employees' voluntary contributions to other unfunded schemes:
  a. Premium for private health insurance.

Concerning the definition of notional saving we follow Börsch-Supan et al. (2000): income from pay-as-you-go schemes is treated as income and not as dissaving.[12] None of the components mentioned above are directly observed in the SEP. However, given the rich income information in the SEP and given the relevant premium and payroll tax percentages, it is possible to impute most components of notional saving rather precisely. This is not true for the premium for private health insurance (nor for possible employer's contribution to an employee's private health insurance). Persons with a 'gross' personal income (net of occupational pension premiums) below 26,750 are compulsory insured through the sick fund. This implies that private health insurances are only relevant for persons with an income above 26,750. Data from the SEP suggest that basically everyone of this group is covered by a private health insurance policy. We have adopted the CPB-procedure of imputing the premium of a so-called `standard health insurance policy', including the employer's contribution. As with the imputation of pension premiums, this procedure does not take into account the considerable variation in the employers' contributions and in the private health insurance policies.

Table 3.4 shows that the average level of notional saving (9,765) is similar to its median (10,647). Between ages 25 and 60 the average share of notional saving in gross household income is fairly constant at 27% (see Table 3.7). The notional saving rate drops precipitously after age 65. This is largely due to the fact that the retired do not pay taxes for most social insurances: SS, Disability, Unemployment, and the insurance for earnings loss as a result of illness. Since mean or median gross income do not vary much in the age range 35-55 (see Table 3.1) and given the fairly constant notional saving rate, the average level of notional saving is also fairly constant in this age range (around

[12] If one treats income from PAYG schemes, like SS and UI, as dissaving, notional saving should be effectively equal to zero in the aggregate. We have checked in our (imputed) dataset whether the average SS (UI)-contributions are equal to the average income from SS and UI. The average contributions appear to be slightly higher (approximately 10%).

13,000, see Table 3.4). It drops considerably after age 65 to around 2,500.

If we look at the breakdown of notional saving (see Table 3.5), it appears that 'employees' mandatory contributions to other unfunded schemes' is the most important component, followed by 'employees' mandatory contributions to unfunded pension systems' and 'employers' mandatory contributions to other unfunded schemes'. Voluntary contributions to unfunded schemes (=premium private health insurance) are small. This is the direct consequence of the fact that most persons are covered by the mandatory sick fund scheme. As we have said before, only persons with higher incomes (above 26,750) have to buy a private health insurance. It appears that 33% of the households have at least one private health insurance policy. Consequently, the distributions of the employees' and employers' contributions to private health insurance are rightly skewed and the averages are rather low.

3.4 Disposable income, notional and mandatory saving rates

Disposable household income is obtained by subtracting taxes, notional and mandatory saving from gross household income. Table 3.6 presents the distribution of disposable household income by age. Average disposable income is equal to 24,000 and somewhat higher than the median (22,000). The shape of the age profile of disposable income is similar to that of gross household income. Its average level rises quickly until age 35, to a level of about 27,000, remains fairly constant until age 55, drops somewhat after age 60 (early retirement), age 65 (mandatory retirement age) and after age 75 (due to a decrease in average family size).

Again, we like to point out that on the basis of a cross-section no conclusions can be drawn concerning the life-cycle profile of disposable income. The hump-shaped profile may be caused by cohort effects, e.g. stemming from productivity growth. Therefore we exploit in figures 1a and 1b the longitudinal nature of the SEP. In these figures, we plot median and mean disposable income (expressed in 1990 prices) from 1985 to 1996 for each 5-year-of-birth-cohort.[13] For clarity, the graphs

[13] In 1990, Statistics Netherlands revised the income part of the SEP questionnaire considerably. Before the 1990 wave, the SEP questionnaire contains for each component questions about net income, earned last month. From the 1990 wave onwards, the SEP collects for most income components information on 'gross income' of the previous calendar year. For instance , the 1990 wave of the SEP contains information on income of the calendar year 1989. See Appendix 1 for more details. Obviously, the revision of the SEP questionnaire hampers the comparability over time of the income figures considerably. However, notice that we effectively have 2 observations on disposable income in 1989. This allows us to assess the effect of the revision of the income questionnaire. From figures 1a and 1b it becomes apparent that the revision of the questionnaire has only a small effect on median disposable income. However, for the young and middle-

only indicate the average year when the head of the household was born (for example, "38" refers to heads of households born between 1936 and 1940). The vertical difference between lines measures the "cohort-time" effect. The difference along a line measures the "age-time" effect.[14] Figures 1a and 1b suggest that (except for the old generations) a cohort-time effect is present. The study of Kapteyn, Alessie and Lusardi (1999) suggests that this cohort-time effect can be partly attributed to productivity growth. Figures 1a and 1b also suggest that (after a cohort correction) the age-income profile is still hump-shaped with a top around age 57.

Table 3.7 presents the average notional and mandatory saving rates and the average tax rate by age. From table 3.7 it can be inferred that the wedge between gross household income and disposable income is fairly constant at a level of 45% in the age range 30-55. The wedge decreases considerably after age 65, mainly because the retired do not pay any occupational pension premiums (which falls under mandatory saving) and any SS and social insurance premiums (part of notional saving). In the age range 30-55 the mandatory saving rate is equal to about 5%.

3.5 Financial wealth, real wealth, net worth

Tables 3.8, 3.9 and 3.10 summarize for the year 1996 the age gradient of the distribution of net worth and financial wealth and real wealth, respectively. According to Table 3.8, the distribution of net worth is rightly skewed and very dispersed: average net worth (63,095) is clearly greater than median net worth (27,135). Alessie and Kapteyn (1999) have shown that in contrast with the United States wealth inequality decreased in The Netherlands between 1987 and 1996. They suggest that the positive trend in the home ownership rate and the increasing house prices may explain why median net worth has increased so much between 1987 and 1996.[15] For the median household the share of housing equity in total net worth is considerably larger (especially in 1996) than for households in the top decile in the wealth distribution. Thus, the increase in the house prices is

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aged cohorts the revision of the questionnaire has a sizable impact on average disposable income.

[14] We use this terminology to emphasize that it is not possible to disentangle age from cohort and time effects in these figures. See also below.

[15] Between 1987 and 1996 the home ownership rate rose considerably from 42.7% to 50.5%. According to data of the Society of Real Estate Agents the average price of houses sold rose from 69,500 in 1987 to 119,000 in 1996.

relatively less important for the rich than for the median household, which in turn might explain the decreasing tendency in wealth inequality between 1987 and 1996. In order to back up their claim, Alessie and Kapteyn (1999) have also investigated the distribution of financial wealth. The figures do not show a negative trend in financial wealth inequality.

From Table 3.9 one can infer that the value of median financial wealth (4,600 in 1998 prices) is low. Jappelli and Pistaferri (1999) also report a rather low though somewhat higher number for median financial wealth (7,350) in Italy. In contrast to our financial wealth measure, they include the cash values of life insurances and of defined contribution pension plans and 'foreign assets'. Moreover, in contradistinction to our procedure, Jappelli and Pistafferri do not subtract consumer credit from their financial wealth measure. Finally, they have included the self-employed (compared with The Netherlands relatively many more people are self-employed in Italy). On balance, therefore the differences between Italy and The Netherlands may not be that large.

Table 3.8 shows that there exists a clear hump-shaped age profile for median net worth with a peak in the age range 50-54. In comparison with households in their middle ages median net worth is rather low for the young and old households. One can also observe a hump-shaped pattern in the age profile of average net worth with a peak around age 55. After age 60 average net worth decreases at a much slower pace than median net worth. From Table 3.8 one can compute the interquartile distance ((p75-p25)/p50). This inequality measure suggests that, among the old, wealth inequality is much greater than among the young. In contrast to net worth, we do not observe a clear hump-shaped age pattern in median and average financial wealth.

From Table 3.8 one could be tempted to conclude that people dissave after retirement as the standard life cycle model predicts. To verify this, we plot in Figures 2a and 2b median and mean net worth (expressed in 1987 prices) from 1987 to 1996 for each 5-year-of-birth-cohort. The figures show that there are substantial cohort-time effects as well as age-time effects in total net worth. Within the same cohort, both mean and median net worth are steadily increasing over time. This is particularly true for the young cohorts, but even for some elderly cohorts, mean net worth continues to increase

over time (median net worth remains fairly constant for the old cohorts)[16]. The increase in mean total net worth over the 10-year period is as big as 60,000 for the 1936-1940 cohort. Altogether we see little evidence for a hump-shaped life cycle pattern of net worth. The fact that mean and median net worth increase for most cohorts (except the old ones) in a "parallel" way suggests that time effects may be important. Such a time effect may be due, for example, to common macro shocks, changes in housing prices and the increase in home ownership rates.[17] Figures 4a, 4b and Figure 5a suggests that there are some strong cohort-time effects in the home-ownership rates and average and median real wealth, even between the young cohorts (cf. the difference in the home ownership rates between the 1963 and 1958 generations). Obviously, the strong cohort effects are the main cause for the very hump-shaped cross-sectional age-home ownership profile (cf. Table 3.11).[18]

While important, home-ownership is, however, not solely responsible for the existence of cohort-time effects in total net worth. In Figures 3a and 3b we report financial wealth and show that cohort-time effects are also present in the mean and median of this more restrictive measure of wealth.

Figures 2a and 2b clearly illustrate that on the basis of cross-section evidence (e.g. tables 3.8, 3.9 and 3.10) one cannot answer the question whether or not people dissave after retirement. In contrast with table 3.8, the figures suggest that the elderly do not dissave; see however footnote 16.

4. Financial, real and discretionary saving

So far, we have exploited mainly the cross-sectional variation in the data. Let us now have a more in-depth look at longitudinal patterns. By looking at changes in net worth, financial and real wealth, we can calculate savings, as in Avery and Kennickell (1991). After having calculated such (discretionary) saving measures, we can relate them to the notional and mandatory saving measures

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[16] The age-time effects of the old cohorts (especially the cohort 1910-1915) should be interpreted with care because the estimate of the age-time could be biased for reasons of differential mortality: survival probabilities are known to be positively correlated with wealth implying that rich households are over-represented in the oldest cohorts (see, e.g., Smith (1999)). This correlation implies that one may find a low rate of decumulation after retirement simply because the poor tend to disappear from the sample earlier than the rich.

[17] There is another potential cause for the existence of these time effects. It is possible that the amount of measurement error, and particularly under-reporting of wealth, is decreasing over time.

[18] Figures 5b and 5c and table 3.11 give some information about some other relevant background variables: employment status of the head of household and family size.

which we have presented in the previous section.

There are some problems with such saving measures. The first problem is related to the way the different SEP waves have been merged. The second problem is measurement error.

The data were merged by means of the variable *khnr* which is in principle the identification number of the head of the household.[19] If a household breaks up, the SEP follows both new households. The household to which the (former) head belongs continues to retain the original identification number. The other household gets a new identification number. There is one exception to this rule: the household remains in the dataset (and its identification number does not change) in case of the death of the head of the household unless it concerns a single-person household (e.g. death of a an elderly individual living alone). Measuring saving of those households who experienced a change in family composition (e.g. divorce, marriage), is difficult. In this chapter we assume, due to the way *khnr* is constructed, that in case of divorce the total amount of wealth will not be divided between the partners, but remains with the head of the household. We admit that this is a questionable assumption. Alternatively, Avery and Kennickell (1989) assume that in such cases net worth will be divided in two equal parts. This is a reasonable assumption if the couple is married under common property law. Not everyone (especially the wealthy) in The Netherlands is married under such a contract and in such cases our assumption may be more reasonable than that of Avery and Kennickell (1989).

Another problem is the treatment of those persons who "married into" the sample. While calculating saving, we implicitly assume (due to our choice of identification variable) that these new household members did not own any wealth when entering the sample. Avery and Kennickell (1989) make the alternative assumption that the new household member owned the same amount of wealth as the original household members together. It is clear that both kind of assumptions are arbitrary. Given the discussion above, it seems worthwhile to also consider an alternative saving measure, e.g. the difference between income and consumption. As mentioned in Section 2, the SEP does not observe consumption expenditures. Therefore we will also use the Dutch Consumer Expenditure Survey (CES) to obtain a residual saving measure.

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[19] For married or cohabiting couples, the head of the household is the male. For single parent households, the head is the parent.

Given the problem with measuring saving of non-intact families, one would also be tempted to remove non-intact families altogether from the dataset. However, this could lead to considerable sample selection bias especially if one wants to analyze the saving behavior of the elderly. If one of the members of an elderly household dies, it is conceivable that bequests to children cause the household to lose a substantial portion of its wealth.[20] Such changes in wealth are of interest if one wants to investigate whether households dis-save during retirement. Presumably, the problem of mismeasuring savings due to changes in wealth related to the death of a spouse is less severe if one considers the residual saving measure (income minus consumption).[21]

As other studies have pointed out, both savings derived from differencing wealth and from income minus consumption, show extreme variability (Avery and Kennickell, 1991; Bosworth, Burtless, and Sabelhaus, 1991; Browning and Lusardi, 1996). As Avery and Kennickell (1991, p. 432) mention in their conclusions, "either the measurement error in these data is quite large, or idiosyncratic factors are very important, or both". With these considerations in mind, the characteristics of the savings data require that appropriate econometric techniques be used. After some experimentation, it appeared that the saving data so noisy that we have decided to pool the saving data in the following way: 1988-1990, 1991-1993, and 1994-1996. While it has the disadvantage of reducing the data points to three per cohort, we at least cover the time period by three "stable" points.

In Figure 6 we present for different years the age profile of median change in net worth. This age profile has been estimated non-parametrically by using a kernel-smoothed quantile estimator. For details on the nonparametric estimation and the algorithm used, see Magee, Burbidge, and Robb (1991). Given the noisiness of the saving measure, a rather large bandwidth (15) has been used to construct Figure 6. For all years we observe a hump shaped age-saving profile. Median saving of very young and retired households is about equal to zero. Thus about 50 percent of the households do not dis-save during retirement. This should be related to the fact that according to Figure 3b, the median level of financial wealth of the retired is on the order of 5000. This level of financial wealth is too

[20] The elderly household also loses a considerable amount of wealth in case of death of one of the spouses if the survivor holds a part of the wealth in usufruct.

[21] Neither the income nor the consumption measure of the Dutch CES contain information about bequests and gifts given away.

low to have any appreciable use as a source of consumption financing. Rather, these funds are probably held for precautionary purposes (e.g. to replace durables that break down). Figure 6 also suggests that especially at middle ages median saving is relatively high in 1993 and 1994. Although the age-saving profile is hump-shaped for all years, their shapes differ considerably across years.

In Figure 7 we plot median saving from 1988 through 1996 for different cohorts (1963, 1958,...., 1913). Figure 7 has been derived from Figure 6, meaning that Figure 7 is based on Kernel estimates of the age-saving profiles. We can draw some tentative conclusions from Figure 7. Firstly, the figure suggests that the 'true' age-saving profile is hump shaped. In order to check this claim, we have followed the approach of Deaton and Paxson (1994) by assuming that time effects are orthogonal to a trend. Given these assumptions, we have performed a median regression of the change in net worth on a second degree age polynomial, a second degree year of birth polynomial and a set of time dummies (on which we have imposed the 'Deaton Paxson' restrictions). The results of this regression corroborate the claim that the age profile is hump shaped.[22] Secondly, from Figure 7 one can observe some cohort-time effects at middle ages. Finally, Figure 7 indicates that median saving changes for most cohorts (except the old ones) in a "parallel" way which in turn suggests, that time effects (e.g. the evolution of housing prices) may also be important. Figures 8 and 9 are similar to figures 6 and 7. The only difference is that in Figures 8 and 9 median saving rates have been analyzed and not median saving (in levels).

The cross-sectional age-home ownership profile which can be inferred from Figure 5a may explain the fact that the cross-sectional age-median saving profiles have an inverted U-shape. Moreover, the cohort-time effects observed in Figure 7 may be attributed to the evidence presented in Figure 5a and the evolution of housing prices. To investigate this issue somewhat further, we also analyze in Figures 10 and 11 median changes in financial wealth. These figures suggest that median financial saving is low in The Netherlands: it varies between -500 euros and 1500 euros (at middle ages the median saving rate varies between 1 and 3 percent). One can observe only a slight hump shape in the age profile of financial saving. From this result it follows that the age profile of home ownership rate and capital gains on housing mainly explains the inverted U shape observed in Figures 6 and 8.

In view of the noisiness of saving measures obtained by first differencing wealth, we have also

[22] For the saving rates (change in net worth over disposable income) we obtain a similar result.

analyzed in Figures 12 and 13 the age pattern of a residual saving measure (income minus consumption). The residual saving measure differs in several respects from the 'change in wealth' measure. First, the net worth measure based on the SEP does not include (1) cash holdings, (2) the cash value of whole life insurances (except the life insurance mortgage) and of privately purchased annuity insurances. Savings through these asset items are implicitly included in the residual saving measure. Second, the residual saving measure does not include capital gains because they are not observed in the Dutch CES. Third, the residual saving measure does not measure bequests or inter-vivos transfers.

In contrast to the 'change in wealth' measure (cf. Figure 6), the age profile of residual saving (cf Figure 12) does not appear to be hump shaped.[23] Moreover, it appears that according to the residual saving measure, saving increases with age after age 65. According to Figure 13, the residual saving rate increases to more than 5 percent after age 65. A similar result based on a residual saving measure has been found by Börsch-Supan and Stahl (1991)). They have suggested that the elderly do not dis-save because they are physically constrained by health, in particular when very old, and cannot consume as much as they had anticipated. However, we have to reconcile the big differences between the age-median saving profiles of the two saving measures before drawing such conclusions. One possibility would be the prevalence of *inter vivos* transfers which appear not to be recorded correctly in the Dutch CES. Another explanation here appears to be a data problem with the consumption or wealth data: certain expenditure items or (the change in) net worth may simply not be measured appropriately by the CES or the SEP. At this moment we can only speculate about the nature of the mis-measurement.

5 Policies affecting savings

5.1 Description of the pension system

To better understand the low discretionary saving rates presented in the previous section, it is important to know more about the pension system in The Netherlands (see also Bovenberg and

[23] Figures 12 and 13 suggest that in 1995 there is a considerable dip in saving around age 60. It should be realized that this result might be an artefact of the high variability in the data due to measurement error.

Meijdam (1999) for an extensive description of the Dutch pension system). The pension system consists of three tiers. The first tier is Social Security (SS): everyone in The Netherlands is covered by a general old age pension starting at the age of 65. The second tier of the pension system consists of funded occupational pension plans. Finally, some retired (e.g. the ex-self-employed) have privately bought a pension insurance in the past (this is the third tier of the pension system). As a result, they receive an annuity income from this insurance policy.

The level of the SS benefits is independent of other income but does depend on household composition. In principle, every individual older than 65 receives a SS benefit equal to 50% of the minimum wage. This rule implies that a couple of which both head and spouse are older than 65, receives a SS benefit equal to the minimum wage. A single person household is entitled to a supplement of 20% of the minimum wage so that such a household receives 70 percent of the minimum wage. There are special rules for couples of which only one of the household members is older than 65. In any case, they are entitled to a SS benefit of a single individual. Moreover, such a household may receive a supplementary SS benefit which is negatively related to the earnings of the younger (<65) spouse: if the earnings of the younger spouse are high, the household is not entitled to a supplementary benefit. The maximum supplementary SS benefit is equal to 50% of the minimum wage.[24]

The SS benefit level is indexed by the minimum wage. Normally, the government yearly adjusts the minimum wage by the 'general wage index' ('index regelingsloon'). During the eighties and early nineties, however, the government has not corrected the minimum wage for changes in the general wage level leading to a loss in purchasing power of those retired households who only live on Social Security. For retired individuals with an occupational DB pension benefit, most pension funds have mitigated the effect of the non-indexing of the SS benefit by raising the pension benefits. By reducing the generosity of the public pension scheme, the government has effectively privatized part of the

[24] Between 1988 and 1999 the Dutch government has gradually tightened the rules on the supplementary SS benefit leading to (considerable) reductions of Social Security Wealth of future retirees. Before 1988, every individual older than 65 who lived with a partner younger than 65, was entitled to a SS benefit equal to 100% of the minimum wage irrespective of the earnings level of the partner. In 1999 the government has decided that individuals with a younger partner who qualify for SS only after 2015, will not receive any supplementary SS benefit. Alessie, Kapteyn and Klijn (1997) have effectively used these changes in the SS regulations to identify the displacement between Social Security Wealth and private wealth.

pension system (see Bovenberg and Meijdam (1999)).

The SS benefits are financed on the basis of pay-as-you-go: part of the tax rate over the first income bracket (in 2000: 0- 22,256) is earmarked to finance the SS-benefits (in 2000 The SS-premium percentage was equal to 17.9%). The SS tax is paid only by those younger than 65 years of age. Due to the aging of the population, the SS tax has crept up during the nineties from 14.05% in 1991 to 17.9% in 2000. However, in 1997 the government has modified the financing of the public pension system. As a first modification, it intends to fix the SS-tax in the first bracket of the personal income tax at its 1997 level. As the population ages, a fixed SS-tax rate implies that revenues from SS-taxes fall short of expenditures on SS benefits (see Bovenberg and Meijdam (1999)). Since this deficit will be financed out of general tax revenues, the elderly will implicitly start contributing to the financing of the SS benefits. The second modification to the PAYG system is the accumulation of a so-called SS-fund to deal with temporarily high spending on public pensions when the babyboom generation retires. As Bovenberg and Meijdam (1999) point out, the build up of the AOW fund counts as a reduction of the fiscal deficit.

In order to get an impression of the (relative) importance of SS, we have computed Social Security Wealth in 1995 for three household types.[25] The first household consists of a couple whose head and partner are 65 years old in 1995. The second (third) household consists of a single male (female) who is 65 years old in 1995. Our calculations show that SSW of the first household type is equal to 177,197. SSW of the single males and females are equal to 97,508 and 125,677. [26] Alessie, Lusardi and Kapteyn (1995) have found that median SSW is considerably higher than the median value of occupational pension wealth.

The second tier of the pension system consists of funded occupational pension plans. In general, if the employer offers a pension scheme, participation in such a scheme is compulsory. Occupational pensions are, therefore, quite important in the Netherlands. The vast majority of the occupational pensions are of the defined benefit type. In most cases benefits are determined on the basis of final pay. Such schemes aim at a benefit level such that the sum of before tax SS benefits and before tax

[25] For these types of households SSW is equal to the actuarially discounted value of current and future social security benefits. In this calculation we have assumed that the discount rate (real market interest rate) is equal to 4%.

[26] SSW of single females is greater than that of single males because females are expected to live longer than males.

occupational pension benefits is equal to 70% of final earnings. This replacement rate is reached if one works for forty years with the same employer (implying an annual accrual rate of 1.75%). In this system, pension premiums are usually related to earnings above a certain threshold. The motivation of the threshold lies in the fact that the lower part of earnings is taxed to finance SS-benefits. In practice, many workers do not achieve the 70% final-wage aspiration level because of incomplete careers. Furthermore, even in the case of full careers, two-earner families and single person households get less than 70% because the threshold is based on a SS benefit of a couple (=100% of the minimum wage). However, members of two-earner families or single person households , receive only a SS-benefit of , respectively, 50% and 70% of the minimum wage.

Contributions to the funded occupational pension schemes are typically shared between employers and employees. Premiums are usually levied on earnings above the threshold mentioned in the previous paragraph. Occupational pension saving is tax preferred in comparison with most other forms of discretionary saving (see also Kremers (2000))[27]: pension contributions are tax-exempt, capital income from pension funds are tax-exempt and benefits are taxed. This regime is especially advantageous because the retirees (65+) benefit from a low tax rate in the first tax bracket as they are exempted from paying SS and several other social insurance contributions (see above).

Given the institutional background sketched above, it is not surprising that the vast majority of employees (about 90 percent, see van der Werf and Smidt (1997)) is covered by an occupational pension scheme. In *Pensioenkaart van Nederland* (1987) (Pension Map of the Netherlands or PN (1987)) it is estimated that 99.4 percent of the pension schemes is of the defined benefit type, whereas the remaining 0.6 percent is of the defined contribution type. More than 72 percent of the pension benefits are defined on the basis of final pay. Combining the effects of SS and the occupational pension schemes leads to the following before-tax replacement rates for those individuals who contributed for a sufficient number of years: 34% receives less than 60% of the final pay, 27% receives between 60 and 69%, 20% receives between 70 and 79%, 19% receives at least 80% of final pay (PN(1987)). One should keep in mind that because of the (favorable) tax treatment of occupational pensions (see above), after tax replacement rates are usually substantially higher. For instance, if the before-tax replacement rate is 70% then the after tax replacement rate exceeds 85%.

[27] Alessie, Hochgürtel and van Soest (2000) give a short overview of the Dutch tax system.

The numbers reported above are rather old. However, recent figures still indicate that most pension plans are of the defined benefit type although, between 1995 and 1999, more pension funds have shifted towards a defined contribution scheme (see Insurance Board (2000)). The Insurance Board also observes a shift from DB schemes based on final pay towards DB schemes based on average earnings.

Apart from the old age (65+) pension schemes introduced above, a vast array of early retirement schemes (VUT) were introduced during the 1980 recession, with the aim of reducing the number of unemployed. These early retirement schemes are quite different from the occupational pensions discussed above. They are not funded, there is no state provision (no first tier), early retirees (<65 years) receive gross benefits which are usually 80 percent of final pay, irrespective of years of service (apart from a common vesting period of 10 years). Kapteyn and De Vos (1998) document that these early retirement schemes are highly actuarially unfair and that most employees retire early once they are given the opportunity. In an aging society like The Netherlands, these very generous early retirement schemes cannot be sustained in the future. Therefore, increasingly pension funds replace the very generous PAYG early retirement schemes by less generous funded schemes (see Insurance Board (2000)). Next to the very extensive occupational pension system, most employees are covered by reasonably generous (earnings related) disability and unemployment insurance schemes.

The government has decided to overhaul the tax system. In the new tax system, which is in effect since the first of January of 2001, annuity insurances are treated in a different way. Under the previous tax law, the premiums of (single-premium) annuity insurance policies were tax deductible under certain restrictions and up to an upper limit (2,703 for singles or 5,406 for couples); the limit is higher for some groups like the self-employed who are not covered by an occupational pension plan. Under the new tax law, the deductibility of annuity insurance contributions is curtailed to a ceiling of 1,022. However, this ceiling will be increased for persons who have accrued 'inadequate' occupational pension wealth[28]. Such persons can choose between contributing more to their

[28] Self-employed and employees who regularly changed jobs and faced pension vesting rules, have presumably no 'adequate' pension wealth (i.e. the sum of the SS benefit and the occupational pension benefit will be less than 70% of final earnings).

occupational DB pension scheme[29] or buying an extra annuity based on a defined contribution insurance from a private life insurance company.

The old age pension scheme also provides for a survivor pension even if the employee has no spouse. From 1999 onwards, pension funds have to give their participants the opportunity to abstain from a survivors pension. In return for this, the employee gets a higher pension.

5.2 Discretionary saving versus notional and pension saving

In this section we pay some attention to the question how the social insurance system, SS and occupational pension schemes may crowd out discretionary saving. Since the seminal paper of Feldstein (1974), this question has been addressed many times in the literature. There are not many empirical papers on Dutch survey data investigating the issue of displacement between private wealth on the one hand and SS and Pension wealth on the other hand. We are aware of only three papers (Alessie, Kapteyn and Klijn (1997), Euwals (1999), and Kapteyn, Alessie and Lusardi (1999)). In this section, we also briefly review these papers.

In the previous subsection we have pointed out that The Netherlands has an extensive social insurance system. This is one of the reasons for the high notional saving rate (cf. Section 3). Compared with the United States, for instance, there is less reason to save in order to have a buffer in the event that a member of the household becomes unemployed or disabled. Studies of e.g. Hochgürtel (1998) indeed do not find much evidence for a precautionary saving motive in the Netherlands. Consequently, the large safety net may be one of the reasons why the discretionary saving rate is low in The Netherlands (cf. Section 4).

This evidence can be backed up with data on saving motives. The questionnaire of the 1987 and 1988 waves of the SEP asks whether or not people are planning to put money aside and if so, for which purpose. Several possibilities for the motives have been given in the questionnaire and the respondent can choose one or several combinations of the motives listed. The main possibilities are: to buy a house, to buy a car, to buy other durables, for unforeseen events, for children, for old age, for no specific purpose, and all possible combinations of the above motives. Examining the motives to save in more detail, it is interesting to note that the households who have indicated unforeseen events

[29] In return for the higher contribution to the DB plan, the yearly accrual rate increases from 1.75% to say 2%.

alone or in combination with other motives account for 22 percent of the total sample. There is a very small proportion of households, only 2 percent, that indicates to be saving for old age. The percentage of people who have indicated buying a house as a motive to save is 13 percent, the percentage indicating car purchase as a motive is 12 percent; 15 percent have indicated the purchase of other durables. Although the 22% mentioning a precautionary motive is more than for most other motives, it is still a relatively small minority of respondents.

The *CentER Saving Survey* (CSS) also contains some questions on saving attitudes. The respondents are asked the following questions:
We would like to ask you some questions on your personal opinion about savings. People have many different reasons for saving money for a short or for a long time. Please indicate your opinion about each statement mentioned on the screen below. Is it to you personally of much or little importance?
Several motives to save have been considered in the questionnaire, where answers could be given on a a scale from 1 (very unimportant) to 7 (very important).

In Figure 8 we present the average response to six such questions by age. The graphs presented in Figure 8 are based on the first wave of the CSS (1993). It appears that on average, people do not find it important to save in order to create a buffer for job losses. Given the extensive safety net existing in The Netherlands, this is not surprising. Still some precautionary saving seems to be going on, in view of the fact that in particular saving for unforeseen health expenditures and to have a buffer for unforeseen circumstances is given considerable weight. Supplementing (expected) future SS and pension benefits is not the most important saving motive. On the basis of the CSS data, Euwals (1999) has computed SS wealth (SSW) and Pension Wealth (PW) and has investigated by means of a multivariate ordered probit model the relationship between SSW and PW and the answers to the two saving motive questions presented above. He finds that households with high SSW and pension wealth find it less important to save in order to supplement (in the future) possibly lower SS and/or pension benefits. Again, this result can be interpreted as evidence for substitution between discretionary saving and mandatory saving.

By using the SEP data on private wealth and (constructed) data on SS wealth and pension wealth, Alessie, Kapteyn and Klijn (1997) and Kapteyn, Alessie and Lusardi (1999) have investigated the

question whether or not there is displacement between discretionary wealth on the one hand and SS and pension wealth on the other hand.[30] For pension wealth they do not find displacement at all and for SS wealth they find (more than) full displacement.

6. Summary and conclusions

This chapter consists of two parts. In the first part we have presented summary statistics on the composition of gross income and wealth. Due to the extent of the social safety net, there is a considerable wedge between gross and net household income. Discretionary saving appears to be rather small in The Netherlands although between 1995 and 1998 private wealth changed considerably due to capital gains (cf. Alessie, Hochgürtel and Van Soest (2000)). We have not obtained a clear picture of the saving behavior of the elderly. From the two types of saving measures considered in this study (1) change in net worth or financial wealth, (2) income minus consumption) one can draw rather different conclusions. It appears that differences in measurement are a serious issue, which warrants more research.

In the second part of the chapter, we have paid some attention to the question how the social insurance system, SS and occupational pension schemes may crowd out discretionary saving. We find that the amount of notional and mandatory saving is considerable for most (non-retired) households. Discretionary saving rates are low for the median household. Combining these two results, provides us with (preliminary) prima facie evidence for substitution between discretionary and mandatory (notional) saving of households. We also review other empirical studies on Dutch data which indicate that there exists displacement between private and SS wealth.

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[30] Euwals (1999) has done a similar study on the CSS data. He did not find any evidence for displacement. However, the wealth data of the CSS survey were not fully cleaned and imputed yet when Euwals conducted his study. By not imputing missing values, Euwals has underestimated the wealth holdings of households considerably. His results, therefore, should be viewed with care. On the other hand, the most recent waves of the CSS contain detailed data on pension rights so that the computation of especially pension wealth does not have to rely on many assumptions (these data were not available when Euwals carried out his study). In this respect, the CSS is more suitable to investigate the displacement issue than the SEP, especially with 'cleaned' and imputed wealth data.

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Appendix 1: Socio-Economic Panel

The SEP is a survey administered by Statistics Netherlands for a panel of approximately 5,000 households. The SEP is representative of the Dutch population, excluding those living in special institutions such as nursing homes. The first survey was conducted in April 1984. The same households were interviewed in October 1984 and then twice a year (in April and October) until 1989. Since 1990 the survey has been conducted once a year in May. In the October interview, information is collected on socio-economic characteristics, income and labor market participation. The April interviews contain information about socio-economic characteristics, as in the October interview, but rather than gathering data about income, the April questionnaire includes questions on a wide range of assets and liabilities from 1987 onwards.

Income, mandatory saving and notional saving

From the 1990 wave onwards, the SEP collects for most income components information on 'gross income' of the previous calendar year. For instance , the 1990 wave of the SEP contains information on income for the calendar year 1989. Each employer (or social insurance institution) is obliged to give their employees (social insurance recipients) at the end of the calendar year a so-called 'annual statement'. Among other things this annual statement provides information on the 'gross' salary (or social insurance benefit). The word 'gross' in this context means income before taxes, SS contributions, and health insurance premiums (both the employer and employee part). However, this gross income excludes social insurance premiums (both the employer and employee part), the premiums associated with the occupational pension (again, both the employer and employee part), and the (employers') contributions to dedicated saving plans (see below).

To construct the variable 'disposable income of the household', five construction steps have to be taken consecutively. First, the 'annual statement income' of all respondents is determined. This 'annual statement income' consists of the sum of a number of recorded sources of 'gross' income (see table A1 below). On the basis of these annual statement incomes it is established which of the persons in the core of the household (head of the household or spouse/partner) has the highest 'annual statement income'. This person is considered to be the 'fiscal main wage earner of the household'. This information is relevant to compute taxes and SS contributions.

In step 2, we calculate for each relevant income component the occupational (funded) pension premiums (employer and employee part), the social insurance premiums (UI-insurance, disability insurance etc.) (employer and employee part), and the mandatory and voluntary health insurance premiums (employer and employee part). Pension premiums are calculated for the following income components: (1) wages (separate calculations for civil servants and private sector employees); (2) early retirement benefits (VUT); (3) UI-benefits of civil servants. For the other income components pension premiums are equal to zero. Mandatory and voluntary health insurance premiums are calculated for wages and all wage replacing transfers (all social insurance and SS benefits). For those who are not obliged to pay mandatory health insurance premiums (basically individuals with a high income), a private health insurance premium has been imputed. Social insurance premiums have been calculated for the following income components: wage, UI benefits, disability benefits, sickness benefits. For the other income components, the social insurance premiums are equal to zero.

For each income component (wages, UI benefits, etc.) we have added the pension and social insurance taxes in step 2 to the annual statement figures. For instance, gross wage (before taxes, SS contributions, social insurance contributions, and pension premiums) is basically the sum of the wage according to annual statement (directly observed in the SEP), and the social insurance and pension premiums paid by the employer and the employee. Moreover, in comparison with the income concept 'annual statement income' the following income components have been added in order to calculate the income 'gross personal income': (1) (employer) contributions to dedicated saving plans (see below), (2) gifts, inheritances (3) child allowances. Notice that strictly speaking the income component 'child allowances' is not individual specific but household specific. We have assigned these income items to the 'fiscal main wage earner of the household'.

Some of these calculations are based on rough approximations. For employees in the private sector, the determination of the pension premiums and the private (voluntary) health insurance premiums is based on an approximation adopted by The Netherlands Bureau of Economic Analysis (CPB) in their so-called *microtax model*. Step 2 is necessary because we want to calculate the mandatory and notional saving rates

In step 3, a number of additions to or deductions from 'annual statement income' are combined in order to calculate the final taxable personal income of the main wage earner and of other persons in the

household. On the basis of this result and the information about the income tax coding, the amount of withheld income tax and SS premiums paid can be determined on the basis of the taxable sum (i.e. the taxable income minus the exemption level).

In step 4, the disposable personal income is determined by subtracting the amount of income tax, SS premiums, Social insurance premiums, pension premiums and health insurance premiums paid from the gross personal income (as calculated in step 2). In step 5, gross income and disposable income of the household are calculated. This is done by adding up the gross and disposable incomes of all household members.

The way in which steps 1 through 4 are carried out is indicated in the calculation diagram below.

Table A1: steps and the (coordinated) calculation diagram for the spendable income of the household				
	Step 1	Step 2	Step 3	Step 4
Income components	Annual statement income [a]	Gross pers. income [b]	tax pers income	disp. pers income
A. INCOME FROM WORK				
wage	+	+	+	+
(employer) contr. to dedicated saving plans	0	+	0	+
Fiscal profit	+	+	+	+
B. ASSET INCOME				
Dividends	+	+	+	+
Interests	+	+	+	+
Real estate income (rents etc)	+	+	+	+
Rateable value of own accommodation	0	0	0	0
Mortgage interest paid	0	0	0	0
capital gains	0	0	0	0
Government contribution to home owners	+	+	+	+
C. ANNUITIZED PAYG PENSIONS (PRIVATE AND PUBLIC PENSIONS)				
Early retirement pension [VUT]	+	+	+	+
General old-age pension [AOW]	+	+	+	+
[AWW] and other widows' pensions	+	+	+	+
D. ANNUITIZED FUNDED PENSIONS				
Annuity	+	+	+	+
Other OCCUPATIONAL old-age pensions	+	+	+	+
E. PUBLIC NON-PENSION TRANSFER INCOME				
Short-term unemployment benefits [WW]	+	+	+	+
Long-term unemployment benefits [RWW]	+	+	+	+
UI benefit for ex-civil servants	+	+	+	+
Disability pension [WAO]	+	+	+	+
General disability pension [AAW]	+	+	+	+
Invalidity pension of ex-civil servants	+	+	+	+
Welfare [ABW, BZ]	+	+	+	+
Sickness benefits	+	+	+	+
Individual rent allowance	+	+	0	+
Public student grant	+	+	+	+
Child allowance	0	0	0	+
F. NET PRIVATE TRANSFERS				
Alimony received	+	+	+	+
Alimony received on behalf of children	+	+	0	+
Support from family	+	+	0	+
Other income	+	+	0	+
Inheritances, gifts	0	+	0	+
Alimony paid	-	-	-	-
Alimony paid on behalf of children	-	-	0	-
Support for relatives paid	-	-	0	-
COMPONENTS RELEVANT FOR FISCAL CALCULATIONS				
Work-related expenses (5%-arrangement)	0	0	-	0
Deduction for self-employed	0	0	-	0
Car provided by employer	0	0	+	0
Income tax+ SS premiums	0	0	0	-
Health insurance Premiums (mandatory)	0	0	0	-
Health insurance Premiums (voluntary)	0	0	0	-
premiums occupational pensions	0	0	0	-
premiums social insurance	0	0	0	-

Legend: 1) Calculation: + = plus; - = minus; 0 = not included in the income calculation; [a] Income items are net of social insurance and pension premiums,

[b] Income items are gross of social insurance and pension premiums

Explanation of some income components

Income from work

- Wages/salaries
- (employer) contributions to dedicated saving plans

As per 1 January 1994, new employee savings and profit sharing schemes have been introduced for employees in The Netherlands. Two main facilities can be distinguished:

1. The 'employee saving scheme'
2. The 'premium saving scheme'

These two saving schemes are somewhat similar to IRAs. The contributions to these schemes are withheld by the employer.

The contribution to the 'employee saving scheme' is directly observed in the SEP. Under the following conditions one does not need to pay income and social insurance taxes on the contributions to the 'employee saving scheme'[31]

- There is an annual contribution limit: 699 in 1994 and 774 in 1999.
- The contribution is placed in a separate account. In principle, this money cannot be withdrawn for a period of 4 years. The money can be withdrawn earlier if it is used for:
  - buying a house
  - buying bonds, shares, mutual funds and options[32]
  - paying a life insurance premium (no pension insurance). This life insurance could be either an annuity insurance or a whole life insurance. If one uses the contribution to the employee saving scheme to buy an annuity insurance, one can deduct under some conditions the annuity insurance premium from taxable income. Notice that in this case, one can deduct the contribution to the employee saving scheme twice: this contribution

[31] Moreover, there are separate exemptions of amounts on the interest and dividend income from employee saving (premium saving) schemes(see my answer to question 1).

[32] The employer can offer the possibility to use the contribution to the employee saving scheme to buy stock options of the company . In that case, the contribution limit is equal to 1548 instead of 774.

in itself is already tax deductible and the annuity insurance premium is tax deductible.

The 'premium saving scheme', which has also been observed in the SEP, is very similar to the employee saving scheme. However, the contribution to the premium saving scheme is not tax deductible and therefore included in the 'annual statement incomewage' which has been observed in the SEP. The employer can match the employees' contribution up to 100%. The amount added by the employer is tax free as long as it does not exceed 516 (in 1999). In our calculations we assume that the employers' contribution to the premium saving scheme is exactly equal to the employees' contribution. Notice that the variable 'gross personal income' (cf. Column 'step2' in table A1) should include the employers' contribution to the 'premium saving scheme'.

- Fiscal profit (of own business)

First, respondents were asked to provide the fiscal profit for the previous calendar year, and **not** to include compulsory pension premiums, paid at the expense of the profit. If the fiscal profit for the previous calendar year was not yet known, respondents were asked to provide an estimate of it. If they could not give an estimate, respondents were asked to provide (an estimate of) the fiscal profit of two years ago. Obviously, the fiscal profit may be negative and is also included in the calculation as such.

Asset income

This category includes the following sources of income.

- Dividends from shares, stocks, investment accounts or investment funds
- Interest from savings, loans, stocks, bonds, mortgage bonds, investment accounts
- Real estate income (including the letting of rooms)
- Government contribution to home owners (assigned to the 'fiscal main wage earner of the household')

Annuitized Pay-as-you-go pensions

This category includes the following sources of income (all components directly observed):

- Early (occupational) retirement pension [VUT]
- SS [AOW]
- General widows' en orphans' pensions [AWW] (flat rate public pension, like SS)

Annuitized funded pensions

This includes (all components directly observed):

- Private annuities
- Other occupational pensions

Public non-pension transfer income

This category includes the following sources of income (all components directly observed):

a. Social insurance benefits

- Short term unemployment benefits [WW]
- UI-benefits for the civil servants ("wachtgeld")
- Disability benefits [WAO]
- Invalidity pension for former civil servants
- Sickness benefits [ZW]

b. Other social benefits

- General disability pension [AAW]
- Welfare [ABW, BZ]
- Long term unemployment benefits [RWW]
- Individual rent subsidy
- Child allowances , assigned to the 'fiscal main wage earner of the household' (we have imputed this income component. The SEP contains enough information to perform a proper imputation)
- Scholarship or additional support through a government scholarship scheme

Net private transfers

- Alimony received from former spouse
- Child support
- Parental support received by students
- Support from family
- Inheritances, gifts
- Alimony paid to former spouse
- Child support
- Other support to relatives
- Other income

Components relevant for fiscal calculations

- Work-related expenses (5%); We have used the maximum deduction for work-related expenses (for current or past jobs).
- Deduction for self-employed. This concerns an amount that can be deducted from the income from business/enterprise.
- Rateable value of owner-occupied accommodation (see above for an explanation).
- Mortgage interest paid.
- Company car. In case the employee has a car provided by his or her employer, a part (20%) of the list value of the car is added to the taxable income.
- Income and social insurance tax withheld. The amount tax of withheld in 1993 is based on the taxable amount. The taxable amount is calculated by subtracting the exemption (according to the income tax schedule) from the taxable income. The exemption level depends on socio-economic and demographic characteristics of the household. Since 1990 the tax schedule has not changed dramatically. The tax schedule in 1995 is as follows:

tax bracket	marginal tax rate
taxable sum<44349	6.35% (excl. payroll taxes)
44349≤taxable sum≤86696	50%
taxable sum>86696	60%

Payroll taxes are levied over the lowest tax bracket. Payroll taxes include the following components:[33]

a. SS [AOW], tax in 1995: 14.55%
b. General widows' and orphans' pensions [AWW], tax in 1995: 1.80%
c. General disability pension [AAW], tax in 1995: 6.30%
d. Special health cost act [AWBZ], , tax in 1995: 8.55% (plus a small nominal premium).

The purpose of the AWBZ is to cover risks which are not covered by the sick fund insurance and the standard private health insurance policies. It is basically a long-term-care and a preventive health care (vaccinations etc.) insurance.

[33] Individuals who are at least 65 years old, do not pay SS and (most) social insurance taxes.

- Mandatory health insurance premiums. This concerns in particular the premiums of the compulsory sick fund insurance. Basically, only those persons with sufficiently high income (about 27,000) are not compulsory insured through the sick fund. They have to buy a private health insurance. The sick fund premiums (employer and employee part) are imputed on the basis of (annual statement) income information in the SEP.
- Private health insurance. Like The Netherlands Bureau for Economic Policy Analysis (CPB) we have imputed the premium of a so-called standard health insurance and the employer contribution to the private health insurance.
- Social Insurance taxes (employer and employee part). Apart from the sick fund insurance (see above) it concerns the premiums of the following insurances

a. Short term unemployment insurance [WW]
b. Disability Insurance [WAO]
c. Sickness benefits (this insurance replaces earnings in case of sickness) [ZW]

The social insurance taxes (employer and employee part) are imputed on the basis of (annual statement) income information in the SEP.

- Occupational pension premiums. The SEP contains enough information to identify (former) civil servants. For civil servants and former civil servants who currently receive a UI-benefit ("wachtgeld") or an early retirement benefit, the SEP contains enough information to impute the pension premiums rather precisely. The imputation exercise is much more difficult for private sector employees and ex-private sector employees who currently receive an early retirement benefit. Basically, we have adopted the imputation formula proposed by The Netherlands Bureau for Economic Policy Analysis (CPB).

The calculations performed in steps 1 through 5 (cf. Table A1) provide us with sufficient information to calculate the notional and mandatory saving rates at the household level. Disposable household income can be obtained by subtracting taxes, notional and mandatory saving from gross household income.

Assets and liabilities

Every respondent (i.e, a person who is at least 16 years old) in the household has to complete a short

questionnaire on assets and liabilities.[34] In the SEP questionnaire, a distinction is made between the ownership of a particular asset or liability on the one hand, and the value of the asset and liability on the other. Information is collected for the following assets:[35] (1) Checking accounts; (2) Savings and deposit accounts[36]; (3) Saving certificates (certificates of deposit); (4) Bonds, mortgage bonds; (5) Shares, mutual funds, options, and other securities; (6) Value of the primary residence; (7) Other real estate (not used for own residence); (8) Value of the car(s); (9) Net worth of own company (for the self-employed); (10) Life insurance mortgage[37]; (11) Other life insurances with a saving element[38] (starting date of the

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[34] From 1990 onwards, only one household member (the head of the household) reports the value of housing related assets and liabilities (i.e. , the value of the primary residence, remaining mortgage debt, and life insurance mortgage). In most other wealth surveys only one household member has to fill in the questionnaire. There are pros and cons of the approach adopted in the SEP. It is rather unlikely that the main respondent (head of household) has a full knowledge of all asset items held by the members of the household. This problem is especially relevant for those households whose head and spouse keep their financial administration separate. Therefore, Statistics Netherlands has decided to interview all respondents. A disadvantage of the 'SEP approach' is that for instance the balance of joint checking and saving accounts can be reported both by the head of the household and/or his spouse. In that case, there is a potential problem of double counting, although the SEP questionnaire explicitly indicates that in case of joint ownership of some asset and liability items, only one respondent should report its, preferably the head of the household.

[35] The April 1987 and 1988 questionnaires also contain questions concerning the asset category 'Claims against private persons' (friends, acquaintances). In all waves information has been collected on tangibles (paintings, jewelry etc.). However, Alessie and Zandvliet (1993) find that this information is of doubtful quality. They have analyzed changes in ownership status over time of this asset category. Their analysis shows that far more changes in ownership are reported than appear plausible. For instance, it appears that from the 1277 households that do report ownership of tangibles for 1987 and/or 1988, only 781 households have some tangibles in both years. Given these implausible results we have decided not to use the information on tangibles.

[36] We assume that the respondents include the balance of their dedicated saving accounts when they answer the question on the total balance of all their saving accounts. Notice that we cannot distinguish the balance of the dedicated saving accounts from the balance of the other saving accounts. However, we know whether the household has dedicated saving accounts and we know the annual contribution to these saving accounts. Unfortunately we do not observe the annual withdrawal from the saving accounts.

[37] A special type of mortgage is possible in The Netherlands when buying a house. With this contract, the mortgage debt remains constant during the contract period. The mortgage-holder pays life insurance premiums and, at the end of the contract period, the value of the life insurance policy is used to redeem the mortgage. The cash value of the life insurance mortgage is not directly observed. However, we have imputed its value using the information provided in the survey (the starting date of the insurance, the balance of the mortgage, and assuming an interest rate of 3 percent on a 30 year maturity).The 1990 wave does not contain enough information to impute the cash value of the life insurance mortgage. We have attempted to remedy this problem by merging into the 1990 dataset some relevant information from the 1991 wave.

[38] As already noted by Alessie and Zandvliet (1993) the questions about the other life insurances are rather messy. Only information on the annual premium and the year when the insurance policy was purchased, has been collected. Moreover, no clear distinction has been made between whole life insurance policies and (single premium) annuity insurance policies. Given the information at hand, it is impossible to come up with a reasonable estimate for the cash

insurance, insurance premium); (12) Other assets. These assets are reported at the current market value. From the 1990 wave onwards, no information has been collected on 'Other life insurances with a saving element' and 'Net worth of the own company' (as of 1990, self-employed respondents do not have to report their assets and liabilities). Notice also that the SEP does not contain information on cash holdings and on occupational pension wealth.

The surveys collect information on the liabilities of every respondent. Unfortunately, Statistics Netherlands has revised the questions an liabilities regularly. This potentially limits the comparability of the liability data between years. In the SEP questionnaire of April 1987 and April 1988, the following categories are listed: (1) Personal loan and revolving credit; (2) Purchase on credit, hire purchase; (3) Remaining mortgage debt; (4) Other loans; (5) Other debt. In 1989 ten liabilities categories have been distinguished. These are: (1) Personal loans; (2) Revolving credit; (3) Debt with mail orders, retail debt; (4) Other purchases on credit; (5) Hire-purchase; (6) Remaining mortgage debt; (7) Collateral-based loans; (8) Debt with relatives and friends; (9) Other outstanding debt, unpaid bills; (10) Other debt.

In 1990 and 1991, the SEP distinguishes the following liability categories: (1) Personal loans and revolving credit; (2) Debt with mail order firms, retail debt; (3) Hire-purchase, other purchases on credit, collateral-based loans; (4) Debt with relatives and friends; (5) Remaining mortgage debt; (6) Other loans.

In 1992, Statistics Netherlands has used the following liability categories: (1) Personal loans and revolving credit; (2) Debt with mail order firms, retail debt; (3) Hire-purchase; (4) Other purchases on credit; (5) Collateral-based loans; (6) Debt with relatives and friends; (7) Remaining mortgage debt; (8) Other loans.

Since 1993, Statistics Netherlands has used the following liability categories: (1) Personal loans and revolving credit; (2) Debt with mail order firms, retail debt; (3) Hire-purchase, other purchases on credit; (4) Collateral-based loans; (5) (interest bearing) Student loans (WSF18+) (6) Debt with relatives and friends; (7) Remaining mortgage debt; (8) Other loans.

As of the May 1990 wave, the questions on assets and liabilities have not been asked anymore to those respondents who are self-employed. It appeared that the data on business equity, which have been collected in the April 1987, 1988 and 1989 waves of the SEP, are rather unreliable (see also Alessie,

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value of the other life insurance policies (see also Alessie, Pradhan and Zandvliet (1993). Therefore we have not included this asset item in our measure of net worth.

Lusardi and Aldershof (1997a) and Alessie and Zandvliet (1993)). Therefore we have deleted the self-employed from our sample. Household assets and liabilities are obtained by summing all the assets (except the asset items 'business equity' and 'other life insurances with a saving element') and liabilities respectively of each respondent in the household. Net worth is obtained by subtracting total liabilities from total assets. In this study we also analyze financial wealth holdings. Financial wealth has been defined as the difference between net worth on the one hand and housing equity (value of the primary residence plus life insurance mortgage minus remaining mortgage debt), other real estate and the value of the cars on the other hand.

For confidentiality reasons, the values of all asset and liability items have been top-coded for each category and set at the value of Dfl. 999,997 if the values exceed that amount.[39]Note, however, that very few households are affected by top coding, which is concentrated among the self-employed. In our sample, we exclude the self-employed, and top coding is barely a problem.

We have examined the relevance of non-responses at the respondent level regarding both the size and ownership of assets and liabilities. Non-responses are of two types: "refuse to answer" and "do not know". Most respondents were prepared to answer the question concerning ownership properly. Alessie, Lusardi and Aldershof (1997a) report that a sizeable fraction of respondents refused to report or did not know the amount held in certain assets, such as (mortgage) bonds, savings certificates, other real estate and shares, options and other securities.[40] In the 1996 wave these fractions are smaller for most asset categories (this remark especially applies to the categories 'shares, options and other securities' and 'other real estate'). The panel feature of the SEP has been exploited to impute some of the missing values (for example, in the case of a missing value in the house value in period t, a value equal to the average of period t-1 and t+1 has been imputed, if the household lived in the same house in periods, t-1, t, and t+1). See Camphuis (1993) for details.

To calculate net worth at the household level, we have chosen the following criteria (this refers to the data after imputation): we exclude observations for which (i) the head of the household or the spouse

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[39] As of 1990, the wealth items 'value of the primary residence' and 'remaining mortgage debt' have been top coded at a value of Dfl. 9,999,997. In 1995, the Dollar Dutch guilder (Dutch Florin: Dfl.) Exchange rate was equal to: $1= Dfl. 1.61.

[40] Unlike the SCF, PSID and the Health and Retirement Study (HRS), the SEP does not include bracket questions in order to alleviate the problem of item-nonresponse.

"refuses to answer" one or more questions about their assets or debts; or (ii) at least one respondent answers with "do not know" to one or more questions about his/her assets and debt. After removing the self-employed from the sample, it is possible to calculate net worth for approximately 90% of the households in 1987 (4,154 out of 4,531 households) and for about 95% of the households in 1988 and 1989 (4,287 out of 4,538 in 1988, and 4,410 out of 4,712 in 1989). These samples show some evidence of selectivity (see Alessie, Lusardi and Aldershof (1997a)). Since 1990, item non-response seems to be less of a problem: net worth cannot be measured for less than 5% of the households. It appears that item non-response is especially relevant for saving and checking accounts. No attempts have been made to impute the missing values.

The Consumer Expenditure Survey (CES)

The CES is administered by Statistics Netherlands for a sample ranging from 2,000 to 3,000 households per year. Only in one specific year, 1991, the sample contained approximately 1,000 households. The CES is a time series of cross-sections. The survey started in 1978 and is repeated annually. Households in the survey keep a daily record of all expenses over 25 guilders (per item) during one year. For a limited time period all expenses are recorded, from which yearly expenses on goods with a price below 25 guilders are deduced. In addition to reporting detailed information on the expenditure items of Dutch households, the survey contains information on income, family composition and background information on all members of the household (age, education etc.).

The CES is not a random sample of the Dutch population. Every five years Statistics Netherlands constructs a weighting scheme based on the CES surveys, which is used for the calculation of price indices for the employed. Thus, households whose head is employed are over-represented in the years 1980, 1985 and 1990. In addition, the non-employed are over represented in 1981, and the self-employed are over-represented in 1982 for specific research purposes. Furthermore, since 1985 the method of "optimal allocation" is used in sampling the households (see Statistics Netherlands (1992)). This means that households with a well-defined spending behavior are under-represented compared to those with a larger variability in their spending behavior.

We have aggregated consumption expenditure reported in the CES into eleven major groups: 1. Food (at home and outside home, including alcoholic beverages); 2. Clothing (which includes footwear); 3.

Housing (rent or the imputed rental value of the house for homeowners, housing maintenance, and expenses for the garden); 4. Furniture (so-called white durables, oven and kitchen utensils (cups, plates, pans, etc.)); 5. Utilities (electricity, telephone, water, heating, and maintenance of central heating); 6. Health insurance; 7. Health expenditure (out of pocket); 8. Personal care; 9. Travel and Leisure (education, sport, entertainment, durables such as sailing boats, smoking, holidays expenditure); 10. Transportation (cars, motorbikes, bikes, public and private transportation, communication excluding telephone costs); 11. Miscellaneous.

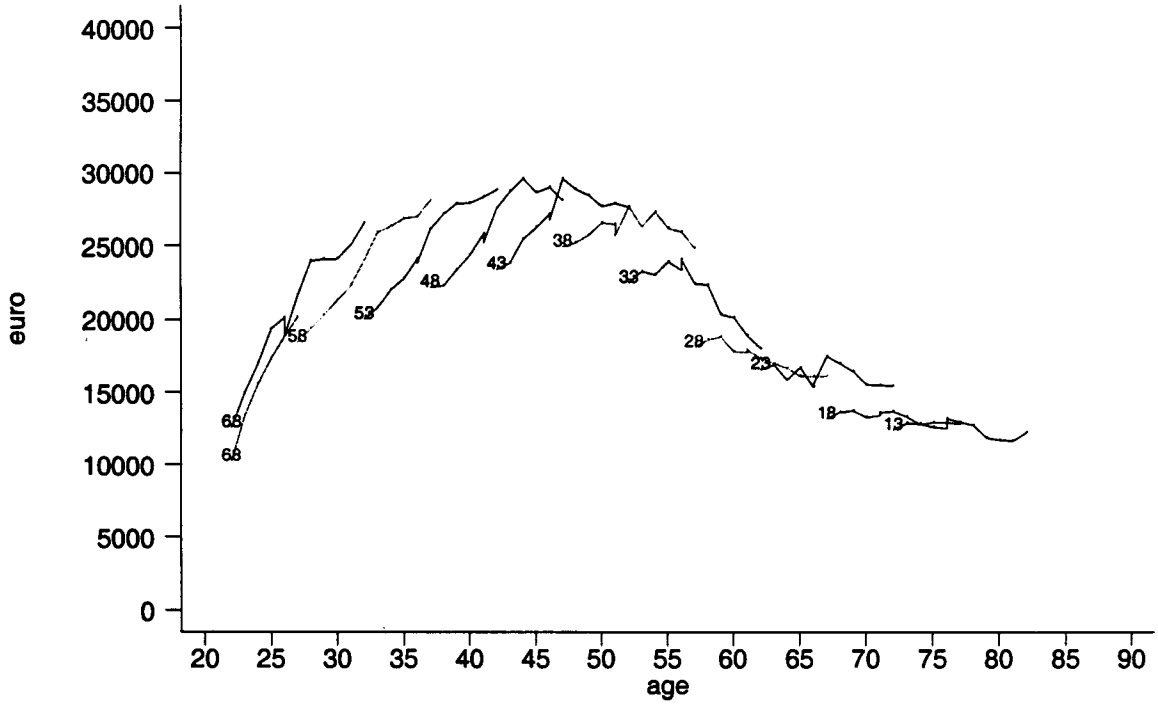

Figure 1a: Median disposable income by age and cohort

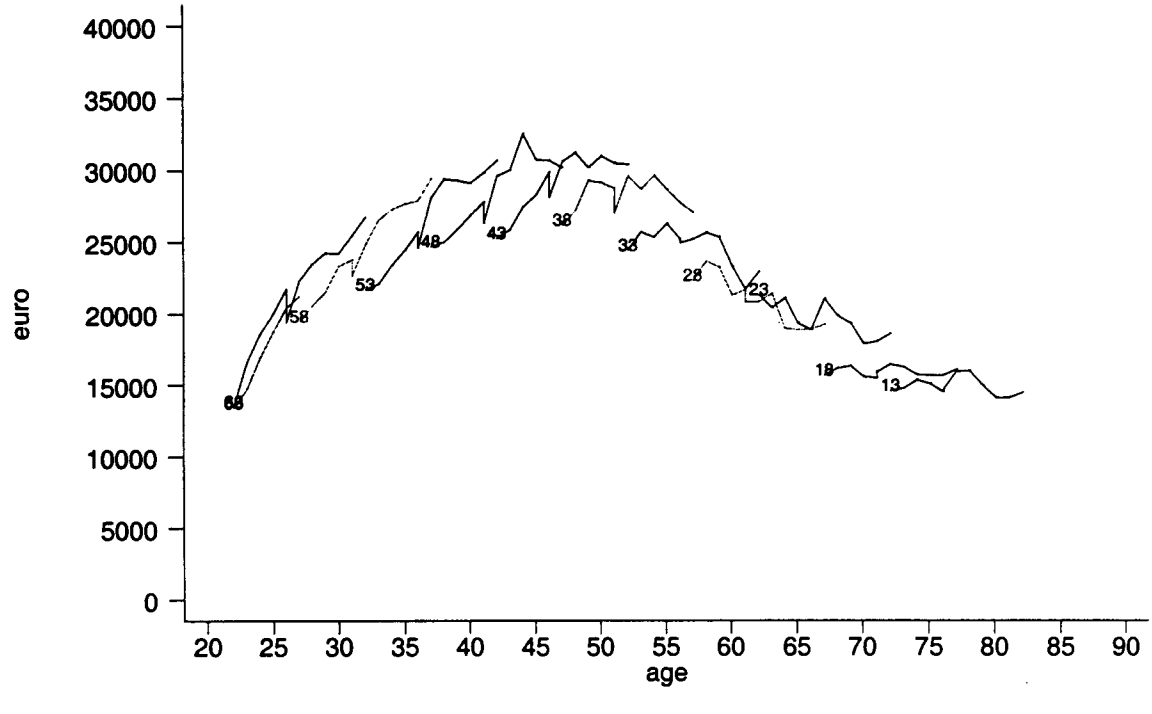

Figure 1b: Average disposable income by age and cohort

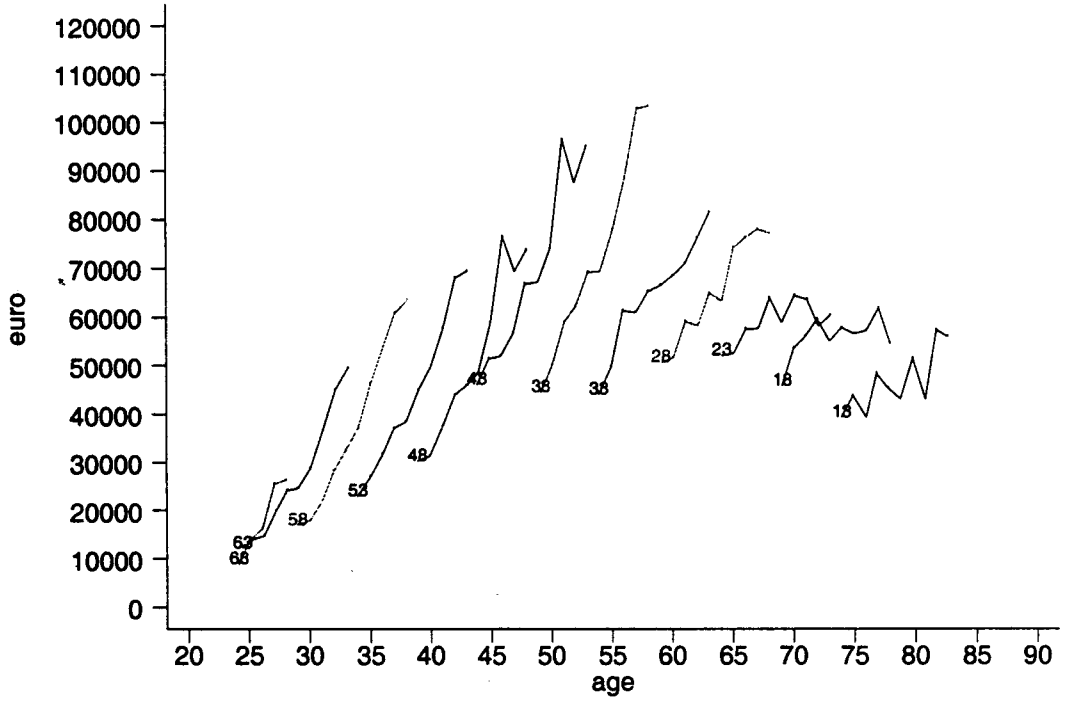

Figure 2a: Mean net worth by age and cohort

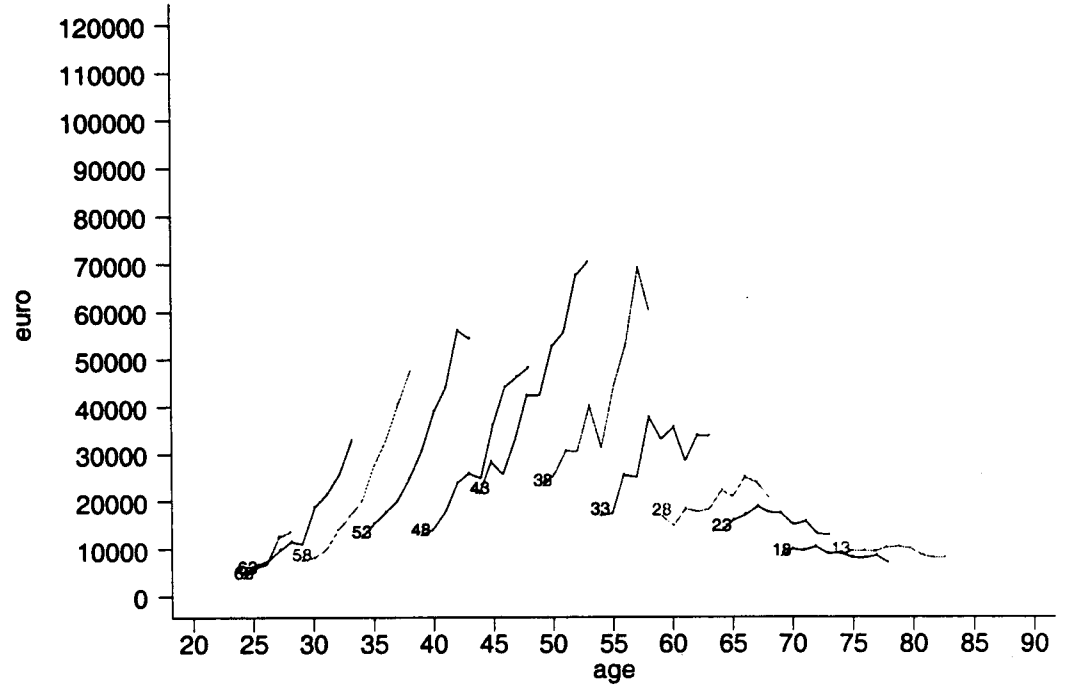

Figure 2b: Median net worth by age and cohort

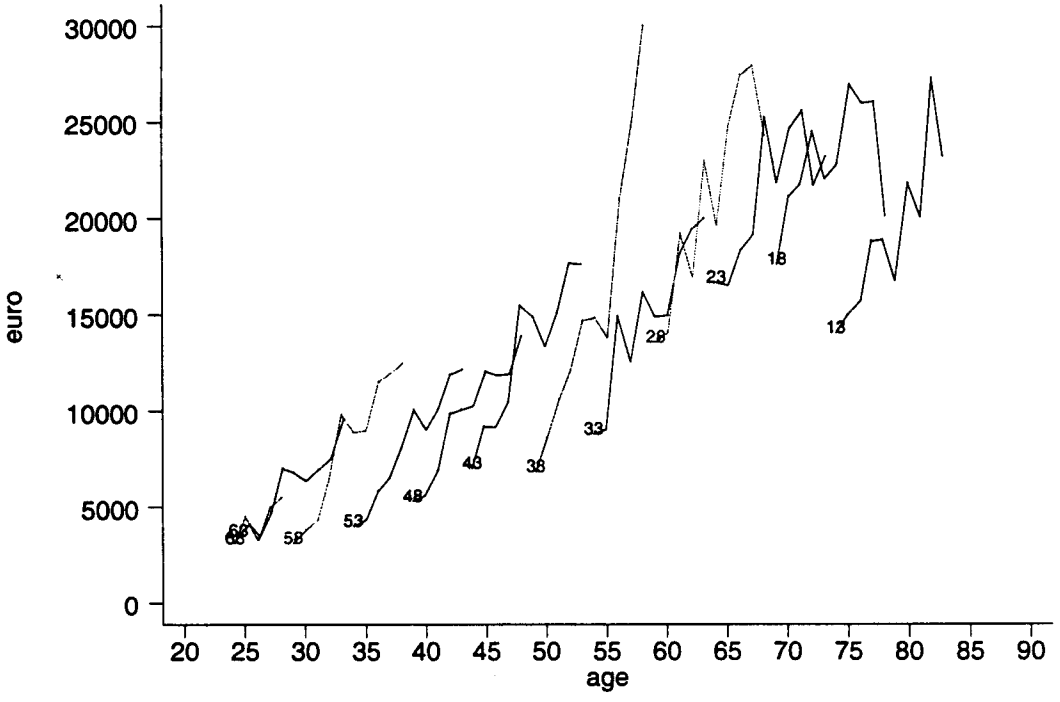

Figure 3a: Mean financial wealth by age and cohort

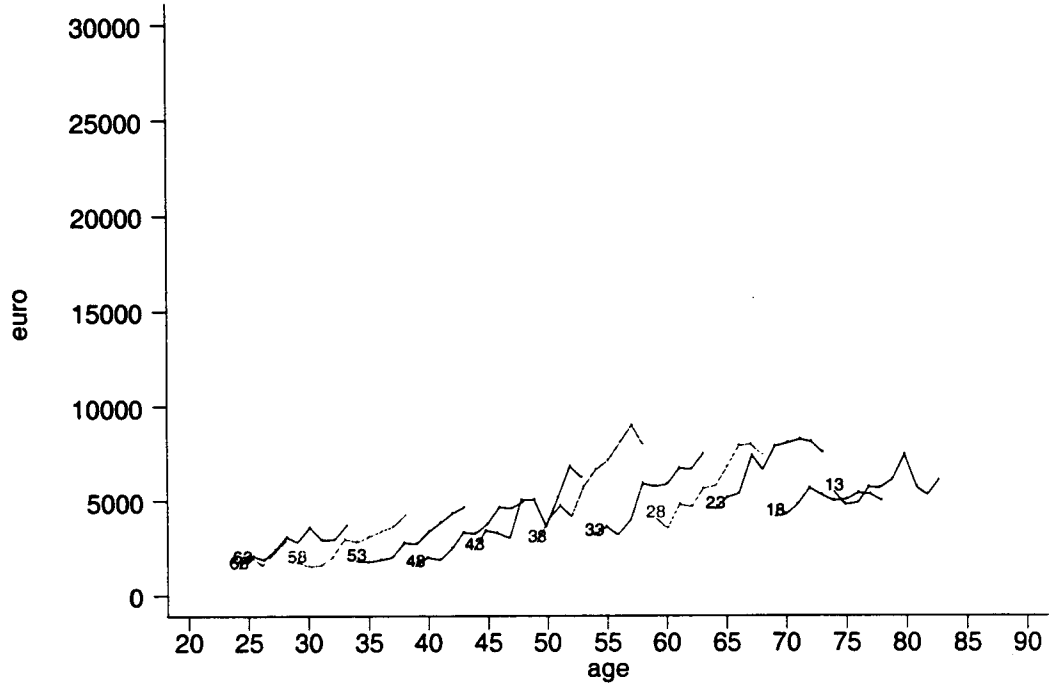

Figure 3b: Median financial wealth by age and cohort

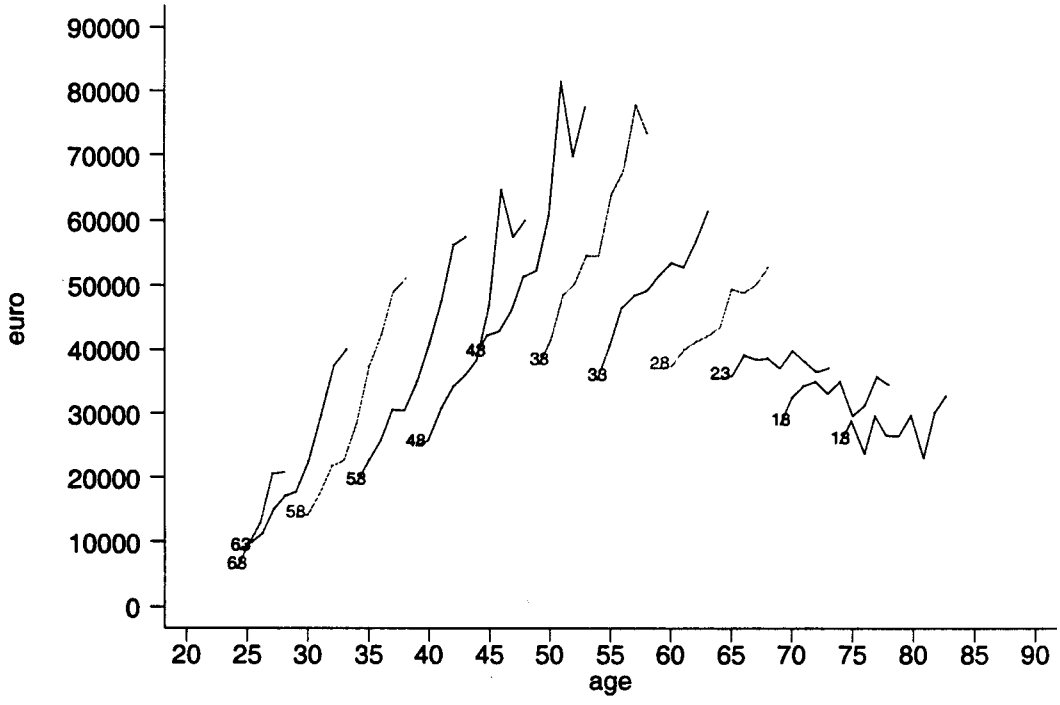

Figure 4a: Mean real wealth by age and cohort

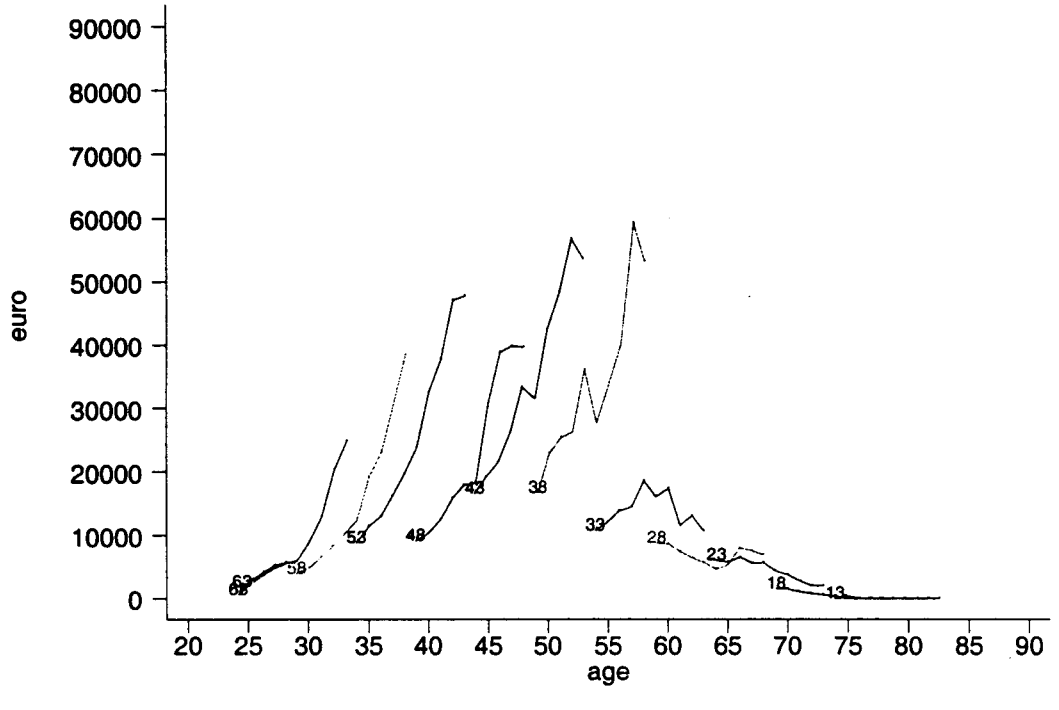

Figure 4b: Median real wealth by age and cohort

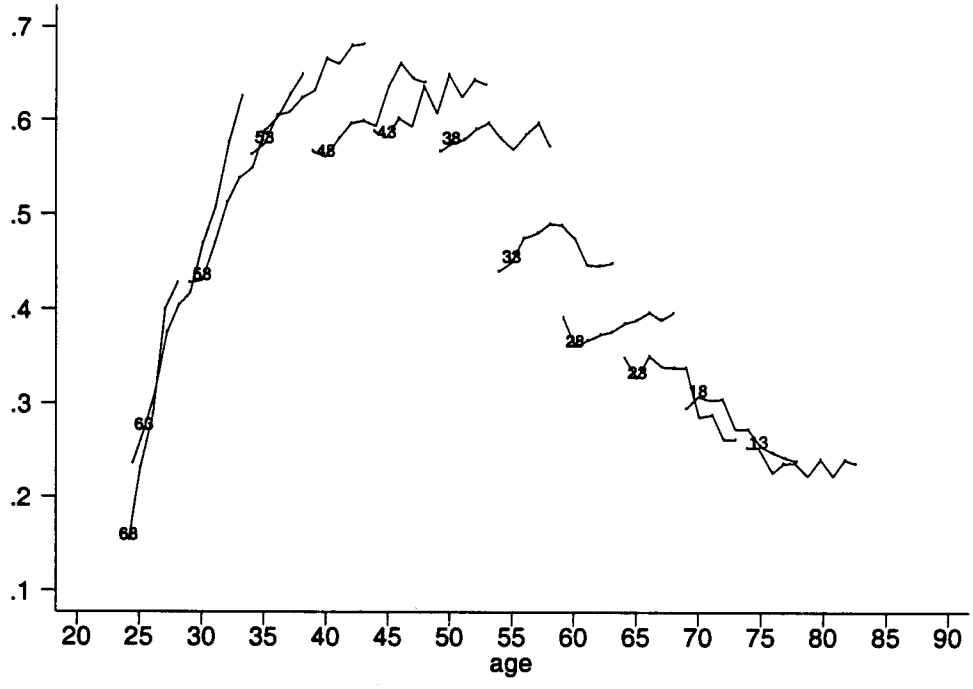

Figure 5a: Home ownership rate by age and cohort

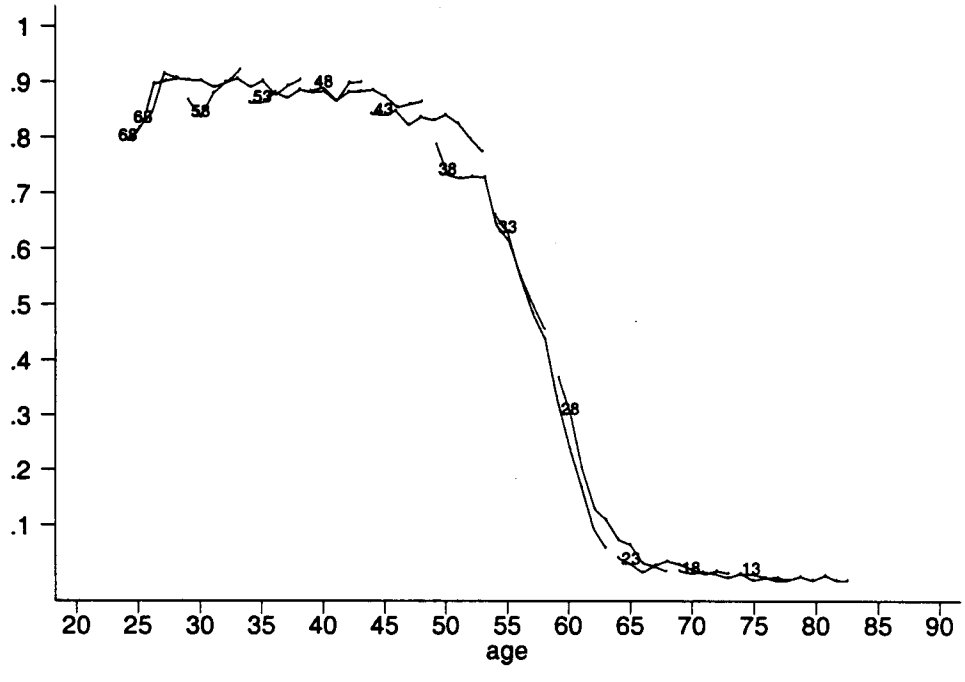

Figure 5b: Employment head by age and cohort

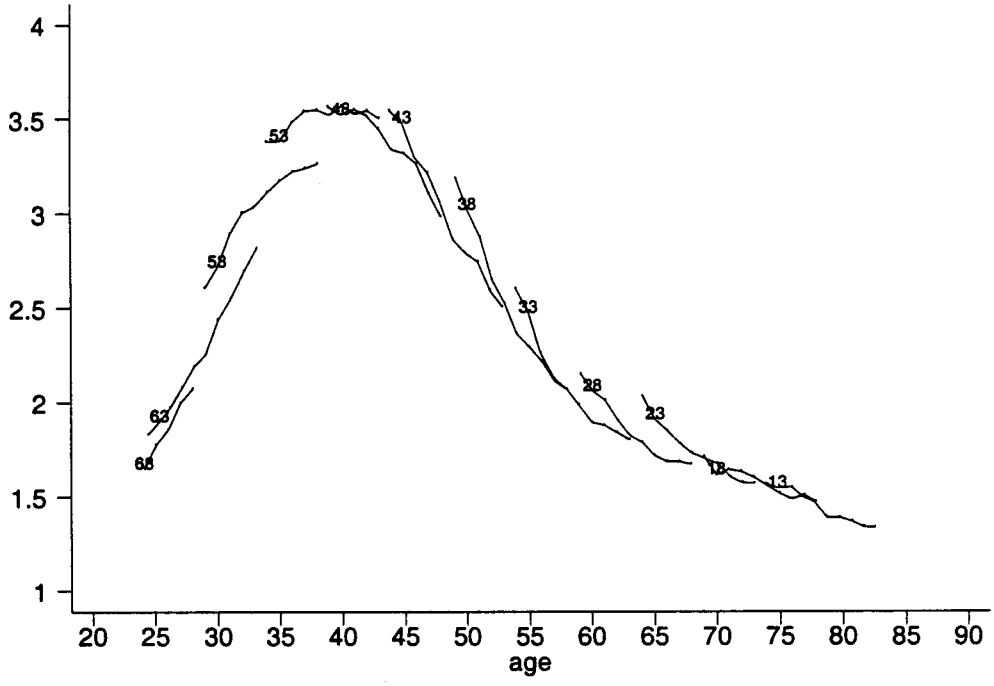

Figure 5c: Family size by age and ccohort

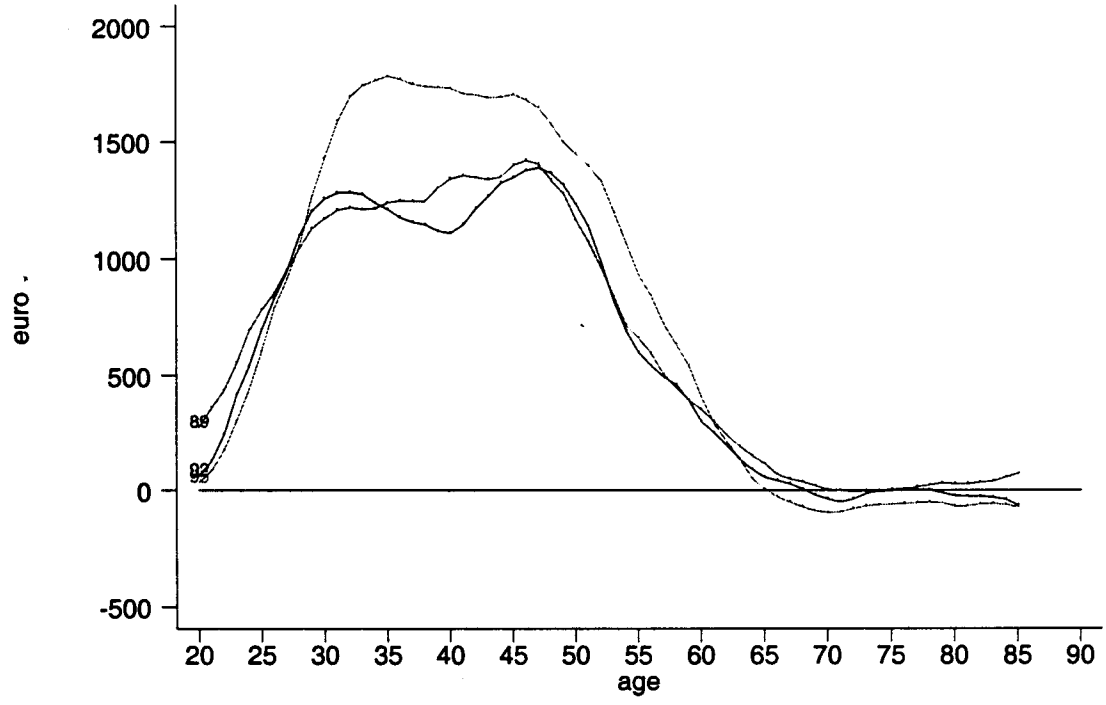

Figure 6: Median saving across age: 1988-1996 (saving=change in net worth)
Legend: 89= pooled data 1988-1990; 92= pooled data 1991-1993; 95= pooled data 1994-1996.

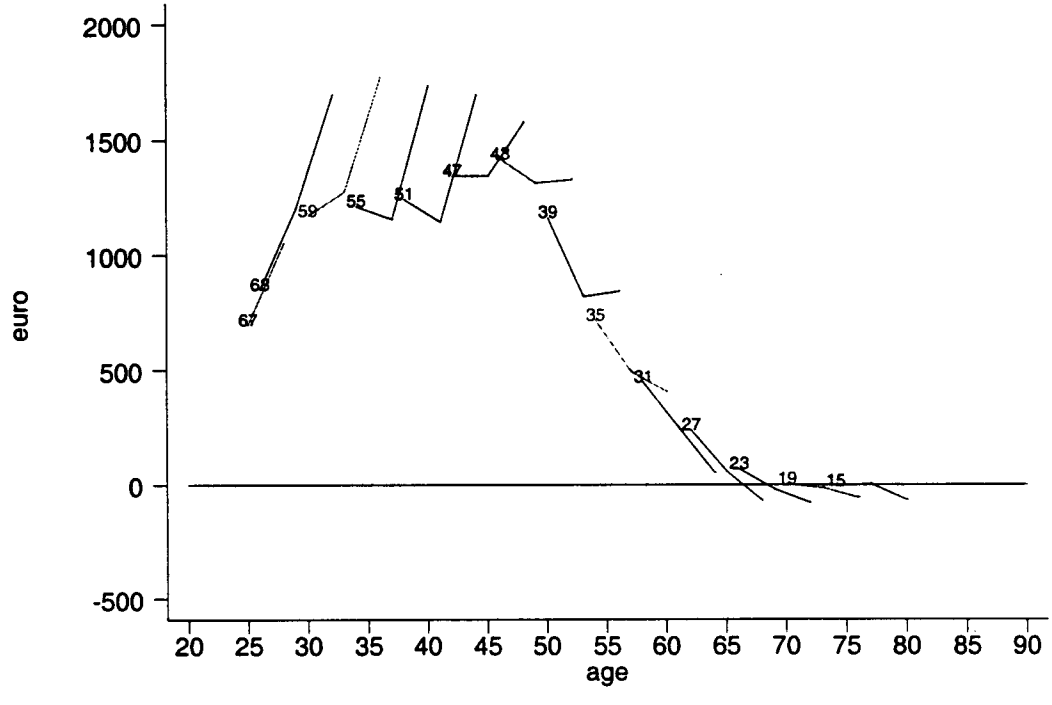

Figure 7: Median saving by age and cohort (saving= change in net worth)

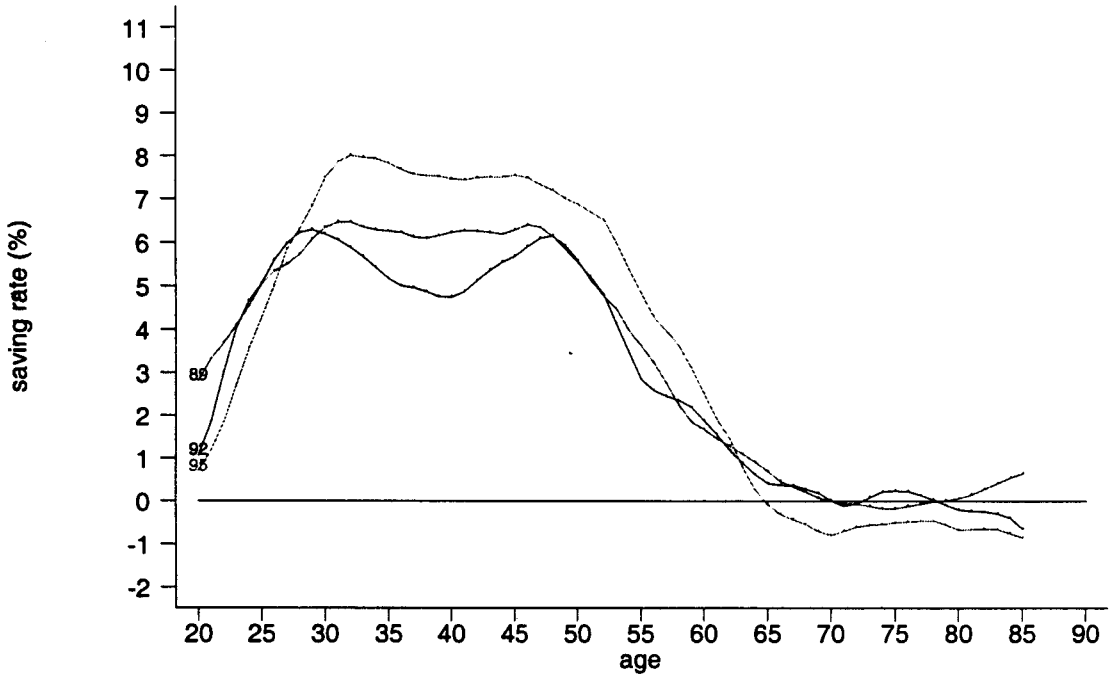

Figure 8: Median saving rate across age: 1988-1996 (saving=change in net worth)
Legend: 89= pooled data 1988-1990; 92= pooled data 1991-1993; 95= pooled data 1994-1996.

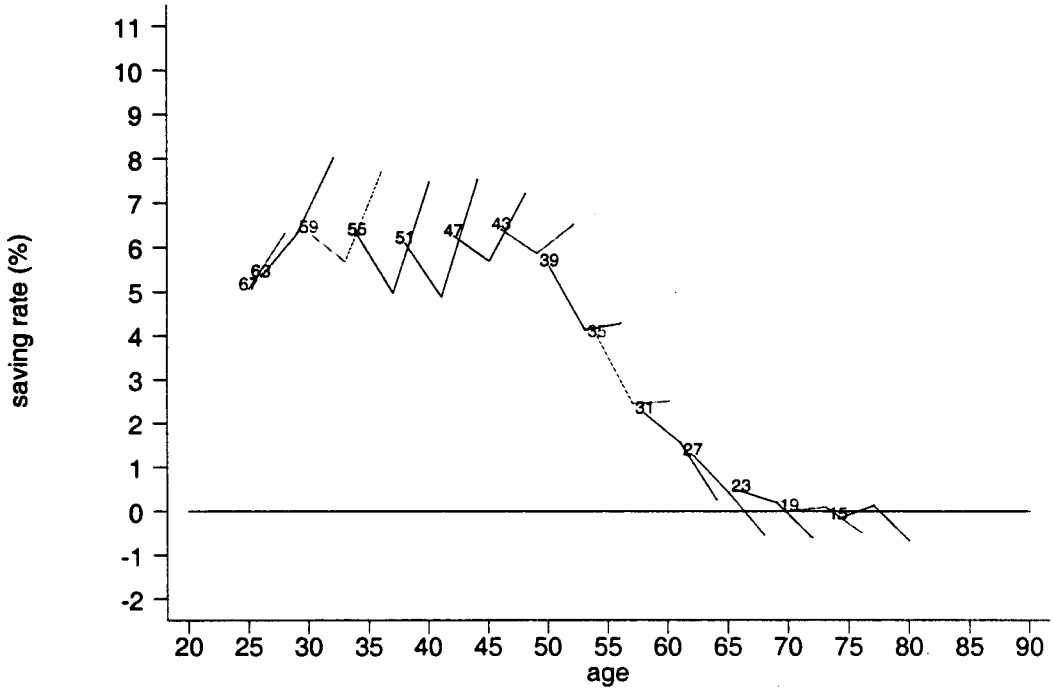

Figure 9: Median saving rate by age and cohort, saving=change net worth

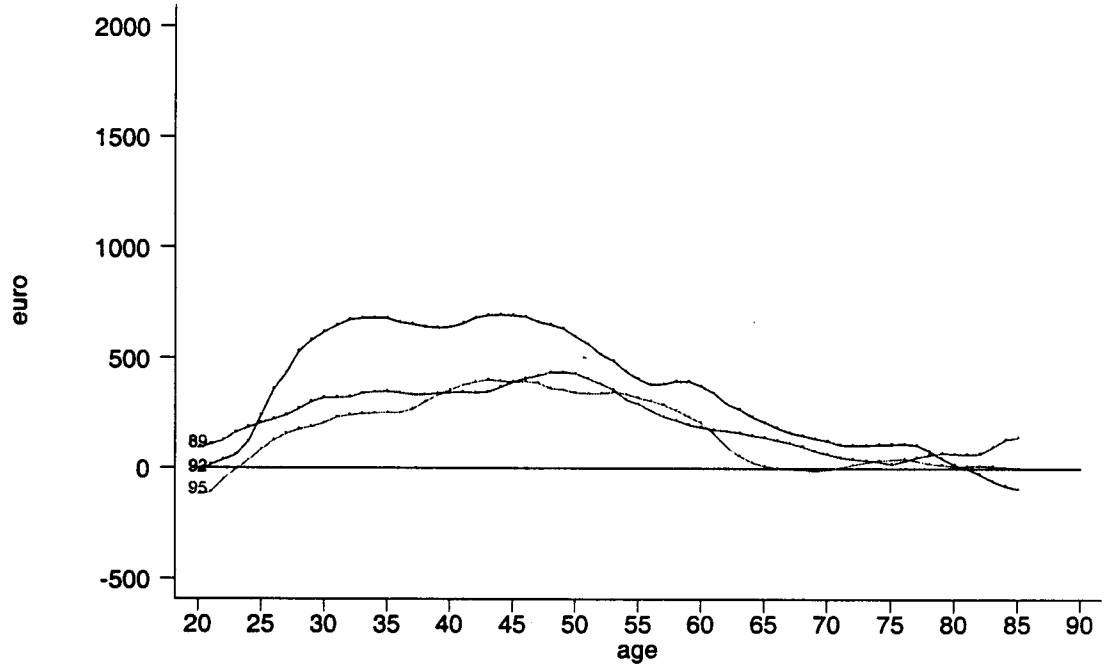

Figure 10: Median change in financial wealth across age: 1988-1996
Legend: 89= pooled data 1988-1990; 92= pooled data 1991-1993; 95= pooled data 1994-1996.

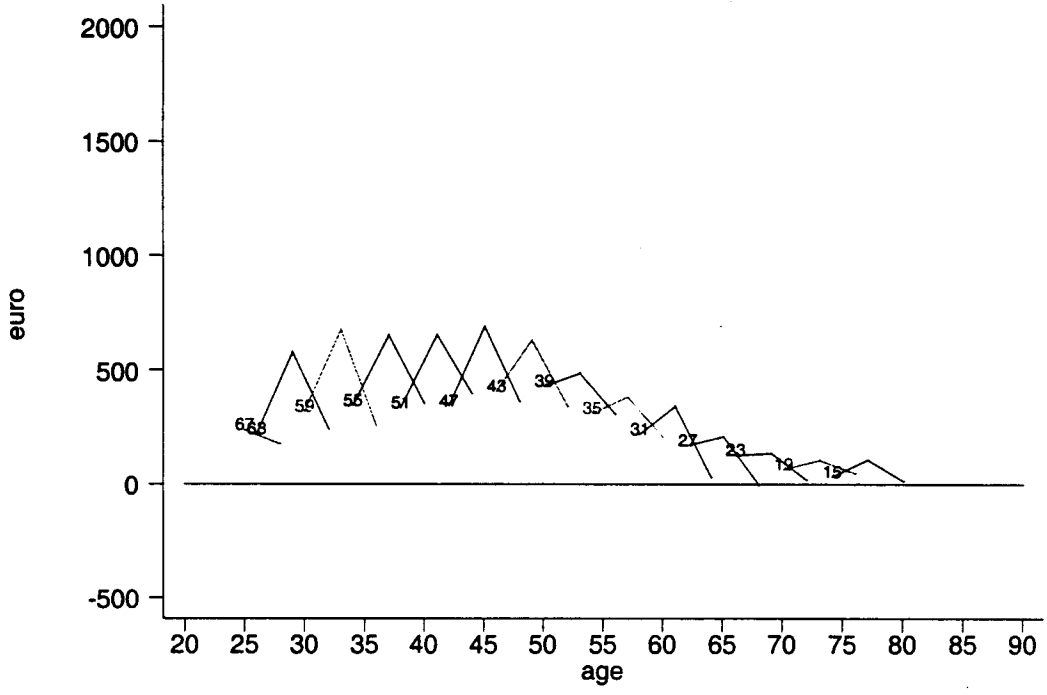

Figure 11: Change in financial wealth across age and cohort

Figure 12: Median saving (residual measure) accross age in 1985, 1990 and 1995
Source: CES

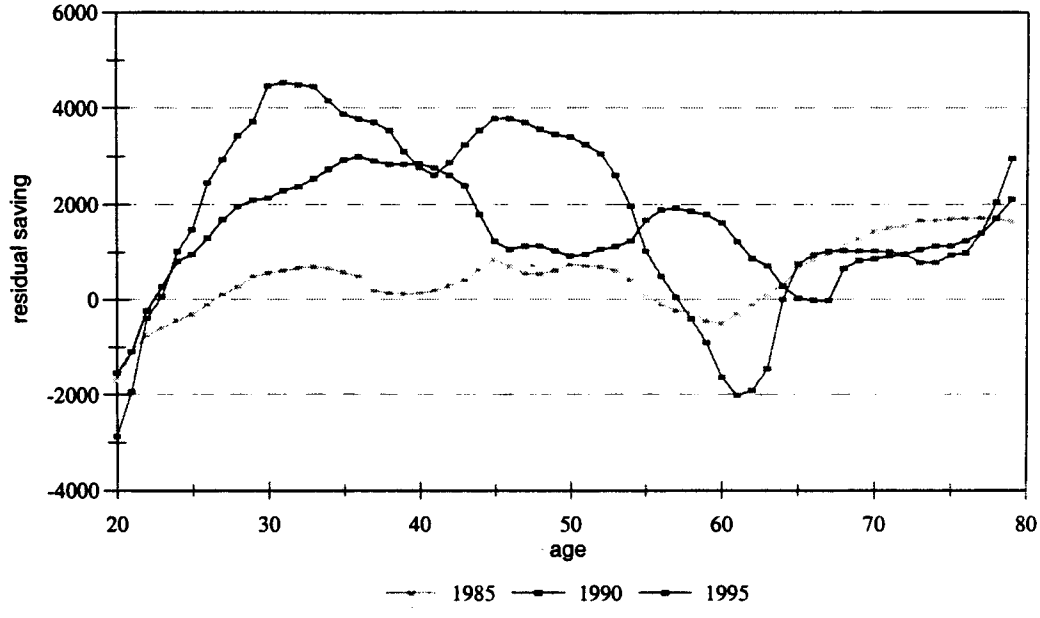

Figure 13: Median saving rate accross age (residual measure) in 1985, 1990, and 1995
Source: CES

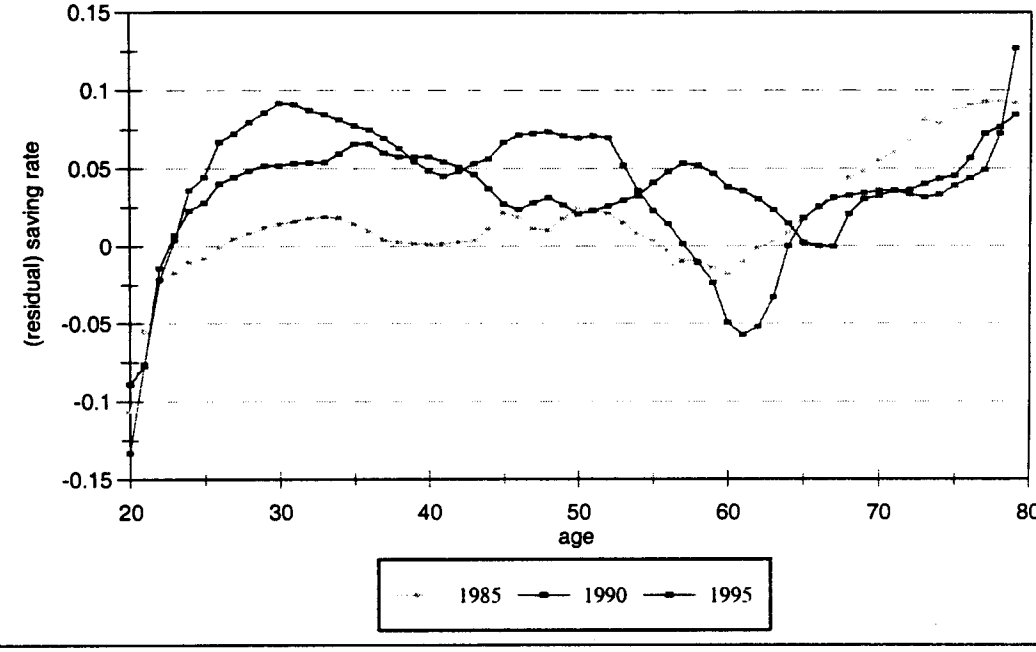

Figure 14: Saving motives accross age (source: CSS)

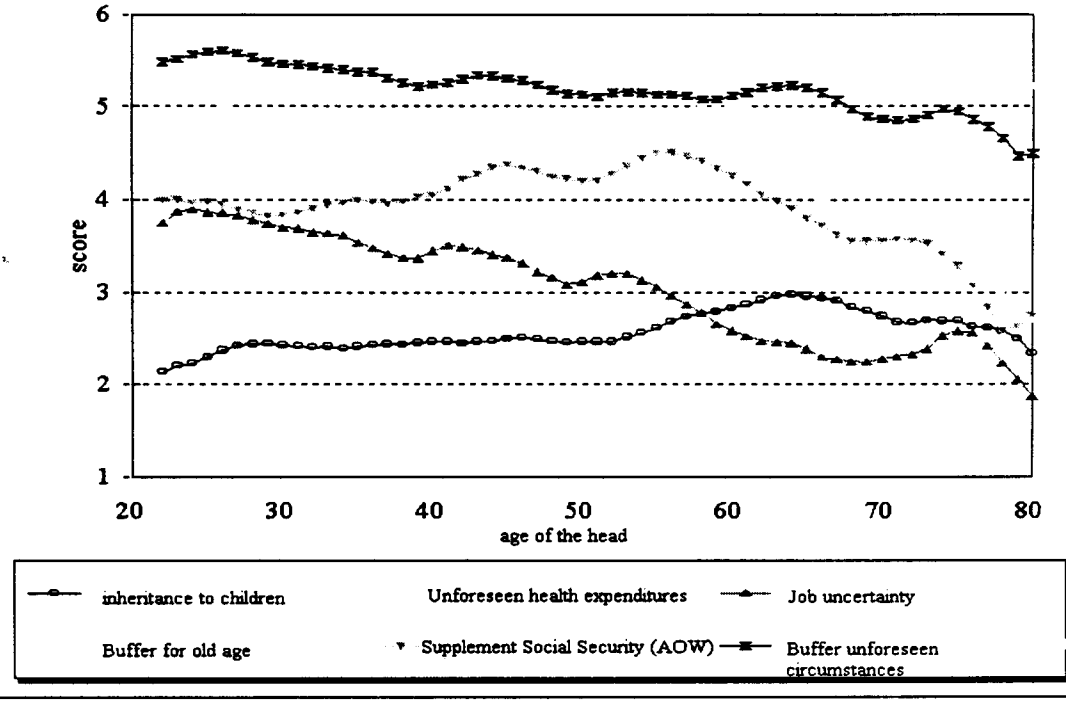

Table 3.1: Total gross income by age in 1995

age class	no. obs	mean	std. error	q1	q2	q3
20-24	208	16545	1492	6036	9415	21359
25-29	366	35075	1012	20779	33894	47772
30-34	434	46374	1175	32090	44726	57858
35-39	508	51200	1533	34460	45782	62257
40-44	505	51782	1313	34980	48740	64484
45-49	436	52630	1526	32669	47935	66596
50-54	334	53503	1764	33100	48114	66358
55-59	265	45928	1677	25790	41593	59283
60-64	256	35672	2061	18688	28159	41964
65-69	316	23344	785	13417	18786	30542
70-74	253	23202	1515	12755	17588	24412
75-79	192	18213	872	10891	14496	19709
80+	161	18348	1110	11096	13562	20341
total	4234	40241	461	18133	35979	53978

Source: own calculations on the SEP

Legend: q1= first quartile, q2= median, q3= third quartile

Table 3.2: distribution of total gross income by age in 1995

age class	totinc	wage	assetinc	SS-inc	pension	priv transf	pub. trans.
20-24	16545	78	0	0	0	7	15
25-29	35075	91	1	0	0	2	6
30-34	46374	93	1	0	0	1	5
35-39	51200	90	1	0	0	2	7
40-44	51782	90	1	0	0	2	8
45-49	52630	89	1	1	0	1	8
50-54	53503	86	1	2	0	1	10
55-59	45928	71	2	6	3	2	15
60-64	35672	18	5	40	7	4	26
65-69	23344	9	4	46	35	1	4
70-74	23202	4	4	48	41	1	2
75-79	18213	3	3	59	34	0	1
80+	18348	3	8	56	32	0	1
total	40241	75	2	9	5	2	8

Source: own calculations on the SEP

Legend: this table reports the share of each income component in total gross income.

totinc= gross income (average amount)

wage= gross earnings

assetinc= capital income

SS-inc= annuitized pay-as-you-go pensions

pension= annuitized pension income

priv. transf.= net private transfers

pub. trans.= public non-pension transfer income

Table 3.3: Mandatory saving by age in 1995						
age class	no. obs	mean	std. error	q1	q2	q3
20-24	208	519	167	0	0	264
25-29	366	1540	77	121	1368	2318
30-34	434	2663	116	1434	2321	3457
35-39	508	3345	186	1555	2643	4280
40-44	505	3412	160	1590	2759	4361
45-49	436	3351	183	1296	2664	4424
50-54	334	3455	220	639	2761	4791
55-59	265	2428	177	0	1559	3963
60-64	256	679	91	0	0	669
65-69	316	119	31	0	0	0
70-74	253	58	25	0	0	0
75-79	192	26	21	0	0	0
80+	161	39	31	0	0	0
total	4234	2066	49	0	1292	3179
Source: own calculations on the SEP						
Legend: q1= first quartile, q2= median, q3= third quartile						

Table 3.4: Notional saving (contribution to payg systems) by age in 1995						
age class	no. obs	mean	std. error	q1	q2	q3
20-24	208	4095	327	1196	1411	6574
25-29	366	10656	317	6292	10916	14870
30-34	434	13432	262	10380	12640	17520
35-39	508	13096	234	10556	12855	15941
40-44	505	13044	233	10880	13152	15942
45-49	436	13319	277	10423	13152	16391
50-54	334	13271	306	10638	13082	16245
55-59	265	11501	330	7423	12076	13918
60-64	256	8403	287	5127	8008	9997
65-69	316	2731	154	1150	1842	3504
70-74	253	2277	136	1027	1642	2888
75-79	192	1844	124	935	1282	2373
80+	161	1805	137	856	1220	2448
total	4234	9765	103	3160	10647	13822
Source: own calculations on the SEP						
Legend: q1= first quartile, q2= median, q3= third quartile						

Table 3.5: distribution of notional saving by age in 1995					
age class	notsav	SS-tax	social ins. tax	employer's cont.	vol. soc. ins.
20-24	4095	29	44	15	11
25-29	10656	32	49	17	2
30-34	13432	31	51	16	2
35-39	13096	31	51	14	4
40-44	13044	31	52	14	4
45-49	13319	31	51	14	4
50-54	13271	31	51	13	4
55-59	11501	33	50	13	4
60-64	8403	39	47	10	4
65-69	2731	18	64	5	13
70-74	2277	16	67	3	14
75-79	1844	15	70	1	14
80+	1805	15	68	1	16
total	9765	31	51	14	4
Source: own calculations on the SEP					
notsav= notional saving (average amount)					
SS-tax= employee's mandatory contribution to unfunded pension systems					
social ins. tax= employee's mandatory contributions to other unfunded schemes					
employer's cont.= employer's mandatory contributions to other unfunded schemes					
vol. soc. ins.= employee's voluntary contribution to other unfunded schemes					

Table 3.6: Total disposable income by age in 1995						
age class	no. obs	mean	std. error	q1	q2	q3
20-24	208	10747	681	5123	8048	13231
25-29	366	20828	557	12737	20028	28140
30-34	434	26524	584	18470	25946	32273
35-39	508	28905	693	20110	27161	34562
40-44	505	29536	645	20295	28191	36024
45-49	436	29420	721	19378	27510	36308
50-54	334	29214	831	18973	26650	37105
55-59	265	25806	868	16259	23901	32165
60-64	256	21940	1538	12224	17721	25625
65-69	316	18455	508	11614	15729	23657
70-74	253	18001	789	11113	15197	20242
75-79	192	14758	552	9347	12720	17108
80+	161	14520	634	9455	11999	16390
total	4234	23988	232	13735	21867	31140
Source: own calculations on the SEP						
Legend: q1= first quartile, q2= median, q3= third quartile						

Table 3.7: Notional and mandatory saving rates by age					
age class	totinc	mandsav	notsav	inctax	dispinc
20-24	16545	3	25	7	65
25-29	35075	4	30	6	59
30-34	46374	6	29	8	57
35-39	51200	7	26	11	56
40-44	51782	7	25	11	57
45-49	52630	6	25	12	56
50-54	53503	6	25	14	55
55-59	45928	5	25	13	56
60-64	35672	2	24	13	62
65-69	23344	1	12	9	79
70-74	23202	0	10	12	78
75-79	18213	0	10	9	81
80+	18348	0	10	11	79
total	40241	5	24	11	60
Source: own calculations on the SEP					
totinc= gross income (average amount)					
notsav= notional saving					
mandsav= mandatory saving					
inctax= income tax					
dispinc= disposable income					

Table 3.8: Net worth by age in 1996						
age class	no. obs	mean	std. error	q1	q2	q3
20-24	210	3421	568	-248	1439	5469
25-29	370	19172	1689	36	8124	29389
30-34	440	45707	3092	5475	29270	69734
35-39	509	63735	3540	6678	47213	92674
40-44	516	68438	3275	9611	52481	99156
45-49	438	70161	3951	7962	48154	112399
50-54	348	94632	8233	13227	73067	132877
55-59	270	102819	9435	7544	60470	136123
60-64	262	83009	7396	4471	35213	123661
65-69	313	72848	6214	3269	20902	108277
70-74	245	71698	7142	4946	14345	109811
75-79	184	50045	7404	2448	8143	50279
80+	151	66941	10654	2057	6925	70734
total	4256	63095	1551	3463	27135	92186
Source: own calculations on the SEP						
Legend: q1= first quartile, q2= median, q3= third quartile						

Table 3.9: Financial wealth by age in 1996						
age class	no. obs	mean	std. error	q1	q2	q3
20-24	210	1084	445	-1484	693	2572
25-29	370	4558	1028	-1875	1532	8205
30-34	440	8351	1122	205	3215	11741
35-39	509	12809	1726	247	4514	12881
40-44	516	11647	1315	212	4487	13929
45-49	438	13538	1709	290	4686	15482
50-54	348	16820	1770	481	6923	21956
55-59	270	29475	5212	619	7573	25524
60-64	262	19868	2472	1325	7163	25425
65-69	313	21226	2705	1376	6276	21248
70-74	245	27828	3549	2895	8805	21764
75-79	184	17861	3197	1484	5290	20157
80+	151	30492	5586	1980	5936	22062
total	4256	15136	653	495	4600	15152
Legend: q1= first quartile, q2= median, q3= third quartile						

Table 3.10: Real wealth by age in 1996						
age class	no. obs	mean	std. error	q1	q2	q3
20-24	210	2336	31	0	0	989
25-29	370	14615	67	0	2968	17313
30-34	440	37355	120	2162	19792	57323
35-39	509	50926	125	3957	38834	76958
40-44	516	56791	120	3463	45855	84957
45-49	438	56623	149	3957	40493	90319
50-54	348	77812	415	4946	58522	110404
55-59	270	73344	351	3957	53221	108920
60-64	262	63141	394	742	12366	98861
65-69	313	51621	263	0	6925	88541
70-74	245	43870	296	0	2968	86563
75-79	184	32183	375	0	0	10017
80+	151	36449	568	0	0	7420
total	4256	47960	19	76	12861	76546
Legend: q1= first quartile, q2= median, q3= third quartile						

Table 3.11: Covariates by age in 1996			
age class	family size	head employed (%)	home-owner (%)
20-24	1.27	72.4	10.0
25-29	1.93	87.0	34.6
30-34	2.61	93.2	60.5
35-39	3.31	91.2	65.8
40-44	3.45	90.5	68.4
45-49	3.08	86.3	63.9
50-54	2.57	79.9	66.1
55-59	2.16	57.8	57.8
60-64	1.81	5.7	45.8
65-69	1.71	2.6	39.9
70-74	1.58	1.6	30.2
75-79	1.49	0.0	22.8
80+	1.35	0.0	22.5
total	2.42	62.4	50.8